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DR. FRANCIS WORKMAN, EMIGRANT, AND THE HISTORY OF TAKING THE CURE FOR CONSUMPTION IN THE AUSTRALIAN COLONIES.

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IN the England of the mid-nineteenth century sea travel had become a recognized means of medical treatment and convalescence. There were several reasons for this increasing interest in the sea. In the first place, the popularity of the open air had been mounting rapidly since the days, back in the 1750's, when Dr. Richard Russell¹ put forward his famous sea-water treatment of the diseases of glands,² and established Brightelmstone as a coastal health centre. Under the elegant leadership of the Prince of Wales, who is reputed actually to have bathed there, Brighton was destined to become one of the most fashionable of health resorts. Russell's treatment included bathing in and drinking sea-water. Thence

it was, presumably, but a natural step to travel upon it. John Fothergill,³ even earlier, had recommended that his patients should winter on the south coast,⁴ whence a sea trip to Lisbon could be easily undertaken. Between 1756 and 1771 three English editions and a French translation were required of Gilchrist's⁵ book on the therapeutic value of sea voyages.⁶ He recorded benefit to a number of consumptive patients; but, indeed, there was classical authority for this advice in the works of Pliny and of Celsus.⁶ Before the turn of the eighteenth century, Buchan's⁷ immensely popular "Domestic Medicine" recorded that "if a voyage [of sufficient length] were undertaken in due time, it would seldom fail to perform a cure".⁸

The advent of steam and steel facilitated the building of large and relatively luxurious ships, whose competition was met by the older shipping firms by designing new and more comfortable sailing ships, carrying first-class passengers besides mail and cargo. Ship designers were thus encouraged to produce square-rigged ships of near

¹ John Fothergill, M.D., F.R.S., 1712-1780; a leading Quaker physician, noted for his account of ulcerative sore throat, his botanical garden at Upton, Essex, and his efforts to heal the breach between England and her American colonies.

² Ebenezer Gilchrist, 1707-1774; physician at Dumfries, Scotland.

³ William Buchan, 1729-1805; a successful physician of Sheffield, Edinburgh and London, whose remains are interred in Westminster Abbey. The first edition of his work was dedicated to Sir Joseph Banks.

⁴ Richard Russell, M.D. (Rheims), 1700-1771, of Lewes, Sussex; noted for his use of sea-weed in the treatment of goltre.

perfection in hull and sailplan. Sail and steam therefore competed, during some twenty to thirty years, for passenger traffic both to east and to west, until the development of the steamship became so advanced that the sailer was ousted for ever from the proud place which she had held for some three thousand years of sea history.

The discovery of uninhabited lands, with apparently perfect climates, was hailed by the medical profession as a panacea for many ills, and to the flow of emigrants was added a tributary stream of sick and convalescent. The migration to these new countries of many European doctors quickly brought the professed benefits of these climates to the notice of doctors at home, and the emigrant bands were swelled further by those in search of health as well as wealth, adventure or escape. Later, the shipping companies attempted, with varying success, to cater more exclusively for these people, and the better companies made a point of the special facilities offered. Thus several firms advertised voyages to Australia each (English) autumn, on comfortable vessels of about 2000 tons burden; these were not "emigrant" ships, but first-class passenger liners, and they were used largely by convalescents, many of whom made the round trip out and back. The Atlantic great circle route, passing well south of the Cape of Good Hope, was considered the best and was nearly always followed, the ship sailing south to 40° or 45° before easting to catch the prevailing westerly winds of the southern temperate zone. The passage to Melbourne took about 30 days. The return voyage was run on a more northerly latitude, and calls were usually made at the Cape and St. Helena. Steam vessels and some auxiliaries were routed through Suez, but this was considered less attractive, climatic conditions in the Red Sea and Indian Ocean being unfavourable to the convalescent. Australia soon became a favourite landfall for the convalescent seafarer, both on account of the long and often beneficial cruise, and through the glowing reports sent home of its warm and congenial climate, more particularly in the southern regions, Victoria and Tasmania, which, throughout the century, offered a haven of hope to the phthisical. Of the growth of this notion we shall have more to say presently.

Medical literature at this time was much concerned with climatology and meteorology, their role in the causation and cure of disease, and their influence on its natural history. Louis,⁸ the great physician to the *Hôpital de la Pitié* in Paris, had written, as early as 1825, that sea voyages were to be preferred to land travel, even suggesting that, as vomiting was part of the treatment of phthisis, so sea travel might be beneficial on this account.⁽⁹⁾ Again we may recall that Celsus advised a rocking bed for those who could not manage to travel on a ship. The same convenient idea had been put forward by Fothergill nearly a century before Louis, although in general Fothergill's ideas on the open-air treatment of consumption were well in advance of his time. In 1829 Sir James Clark,⁹ in an influential work,⁽¹⁰⁾ laid down the principles upon which to base the climatic treatment of consumption. With many other physicians, William Stokes,¹¹ writing in 1837, refers to Clark's book "with pleasure" and mentions patients recovering "even after excavation has formed", the remedies being "the seton, with frequent changes of air, or sea voyaging."⁽¹⁰⁾

The Australian Scene Prior to the Gold Rush.

At this stage it is pertinent to examine the evidence for these beliefs as provided by early references to tuber-

culosis in Australia. The disease must have entered in the early convict era; one death from consumption occurred on the *Lady Penrhyn* in the First Fleet.⁽¹²⁾ However, neither the mortality nor the morbidity seems to have been notably high in any of the early penal settlements. In 1827 Cunningham⁸ wrote of New South Wales:⁽¹³⁾

On reaching the age of puberty phthisis is likely to supervene from the rapid sprouting out in stature of our youths at this period, but the European phthisis is uniformly cured or at least relieved by a removal hither if early resorted to.

Two years later, McLeod,⁸ replying to inquiries made by the Royal College of Physicians in London, stated⁽¹⁴⁾ that consumption of the lungs "was more frequent than from the mildness of the climate might be expected, and more in advanced life suffer from this disease than in England . . . It is remarked that in people who arrive in this Colony labouring under this Complaint it runs a much more rapid course than it is observed to do in colder climates." George Bennett,¹⁵ in 1834, observed that "a number of persons perish from that fatal disease consumption: but I do not regard it as produced by the climate, as it invariably attacks persons from England of dissipated habits, or of employments uncongenial to health."⁽¹⁵⁾ In an interesting paper published in India, Dempster¹⁶ wrote that invalids from there might well "hope to derive the fullest benefit of such [climatic] change . . . in Van Diemen's Land", although his experience of consumption in Tasmania led him to believe that certain severe forms of the disease might be aggravated by the climate.⁽¹⁶⁾ The following paragraph is significant as the first clear statement of a fallacy which gained wide acceptance in subsequent decades:

I was informed by a medical gentleman long resident in the island, that no person born and brought [up] in the colony had died of consumption; but that a few children who were sent to England for education had been carried off by that disease on their return.

The myth of "native" immunity fostered the belief in a specific beneficial effect of climate, and later enabled the public and the profession, for the most part, to view the growing ravages of tuberculosis with comparative equanimity.¹⁷

Of the Port Phillip settlement, D. J. Thomas,¹⁸ reviewing his long experience there, observed that phthisis was rare prior to 1853 (the beginning of the gold era), and that the climate, in nearly every case, tended to check the disease for a time.⁽¹⁷⁾ Similarly, James Kilgour, a medical practitioner in Geelong, advocated the emigration of phthisical persons in a pamphlet published in 1855; he further observed that the disease could arise in Victoria, especially in aborigines.⁽¹⁸⁾ On the other hand, Clutterbuck,¹⁹ writing in 1849, stated that "consumption consigns many victims . . . to a premature grave. To imagine, as many do, that emigration to this Colony tends either to prevent the development of this complaint, or to arrest its progress, is a fatal delusion."⁽¹⁹⁾ He described the course of these patients as one of rapid deterioration, even if the disease

⁸ Peter Miller Cunningham, 1789-1864; a graduate of Edinburgh, who engaged unsuccessfully in farming in New South Wales between periods of service in the Royal Navy.

⁹ D. McLeod was at this time Deputy Inspector of Military Hospitals in New South Wales.

¹⁰ George Bennett, M.D., F.R.C.S., F.L.S., F.Z.S., 1804-1893; a practising physician better known for his research on natural history in Australia.

¹¹ Thomas Erskine Dempster, 1799-1835; superintending surgeon, Indian Medical Service. Further mention of tuberculous emigrants from India is made by Brown.⁽²⁰⁾

¹² Over thirty years later Lindesay Richardson, of Ballarat, Victoria, felt obliged to refute this "popular opinion" before a British audience.⁽²¹⁾ Its original development was regarded almost with surprise by James Robertson in Melbourne at about this time.⁽²²⁾ As late as 1893, some unconvincing statistics were adduced in support of it.⁽²³⁾

¹³ David John Thomas, F.R.C.S., 1813-1871; one of the pioneer doctors of Port Phillip, noted as the first to give ether in the colony.

¹⁴ James Bennett Clutterbuck, L.S.A., flourished 1850-1875; spent several years in the colony as a doctor, but we have been unable to trace any biographical data.

⁸ Pierre Charles Alexandre Louis, 1787-1872; noted for his studies of typhoid fever and tuberculosis, and for his use of the statistical method.

⁹ James Clark, M.D., 1788-1870; best known for his part in the case of the unfortunate Lady Flora Hastings, in which he was probably maligned. Forbes dedicated his translation of the later editions of Laennec's classic work to Clark, stressing Clark's important role in the early introduction of mediate auscultation to Britain.

¹¹ William Stokes, M.D., 1804-1878; an Irish physician prominent in the early history of auscultation, and commemorated eponymously in "Stokes-Adams attacks" and "Cheyne-Stokes" respiration.

was early, attributable to the intense summer heat and the variability of the temperature even over twenty-four hours. Clutterbuck's mention of the arrival of those merely "threatened" with tuberculosis, or of "a habit predisposed to consumption", serves as a reminder that whole families of phthisical stock sometimes migrated to Australia to escape their fate, with what effect on Australian morbidity and mortality rates it is impossible to determine.¹⁵

These diverse views¹⁶ are not as irreconcilable as might at first appear; it is unlikely that any one doctor's experience was large enough to allow him to generalize on the subject of consumption in Australia, and there were no adequate vital statistics upon which to base any conclusions. For present purposes these comments establish, first, that pulmonary tuberculosis existed in Australia prior to the middle of the century; second, that the climate was not regarded as favourable by local practitioners, although there were exceptions; and third, that the practice of "taking the cure" in the antipodes was well established by the 1850's. Indeed, a reviewer of Clutterbuck's book said that the therapeutic value of the modern "Arcadia" of Australia Felix was "undisputed" prior to the closer meteorological study made after the discovery of gold.¹⁶ That its use was not confined to the more privileged classes is clear from evidence given before a select committee investigating the conditions of the working class in New South Wales in 1859: Dr. Isaac Aaron¹⁷ stated that many Government-assisted emigrants with the disease made the journey in expectation of cure. Similarly, James Robertson,¹⁸ in 1861, observed that recent arrivals sent out by their doctors in the hope of cure contributed significantly to the mortality from phthisis in the Melbourne Benevolent Asylum, their downhill course being accentuated by the climate.¹⁹

S. Dougan Bird and the Value of Taking the Cure in the Colonies.

In the circumstances it is not surprising that medical men, themselves suffering from tuberculosis, should essay the long passage to the antipodes and health; indeed, the names of several of them are known to us. One was Samuel Dougan Bird,²⁰ formerly assistant to the resident physician at the Brompton Hospital for Consumption, who in 1863 wrote an influential book eulogizing the Australasian climate and its beneficial effect on the course of phthisis.²¹ Bird described himself as a *poitrinaire*, with "personal as well as professional experience of the effect of antipodal climates on consumption". In his case, "of bilateral softened tubercle", a six months' rest, "occupied in amusing travel [in Europe], with careful treatment in the meantime, failed to do more than check the urgent symptoms", and so in 1860 the more radical measure of a voyage to Australia was taken.

¹⁵ These families included many doctors; Dr. H. Brown's family, of whom six died, including his mother, may be considered representative.¹⁶ It is of interest that in 1884 a study of family phthisis in London, based on insurance statistics, supported the suggestion that a career in the navy or merchant service was helpful in preventing the development of tuberculosis.¹⁷ Peacock quoted French experience of the reverse, but he still advised young men with a family history of consumption to take a trip to Australia.¹⁸

¹⁹ Similar references to those quoted are given by Cleland in relation to the colony of South Australia.²⁰ Views similar to those of Clutterbuck were expressed in regard to Tasmania by Power in 1843.²¹ Swarbrick Hall recorded a significant mortality in Hobart by 1855.²²

²³ Isaac Aaron, M.R.C.S., L.S.A., 1804-1877; a Bart's man, sometime health officer to the city of Sydney, and prominent in the history of Australian medical journalism. The statement attributed to him, quoted *passim* in the *Australian Medical Journal* of the time, is not found in the Commission's official report.

²⁴ James Robertson, M.A., M.D. (Aberdeen), L.R.C.S. (Edinburgh), 1822-1893; a prominent Melbourne physician and sometime lecturer in the theory and practice of medicine at the University of Melbourne.

²⁵ Samuel Dougan Bird, M.D., M.R.C.S., L.S.A., 1832-1904, received his medical education first as an apprentice at Lowtoft and later at King's College Hospital, London. In Melbourne he was for a time lecturer in therapeutics and in medicine at the University.

Within three months of his arrival he had gained over a stone in weight and had lost all his symptoms. After returning to England, and doubtless presenting himself to his distinguished medical advisers, he sailed for Melbourne again in the following year to commence practice. In his book, published little more than a year later, he maintained that climate itself had a specific antituberculous effect, and wrote:

Should we not assume that the first object is to find a climate whose characteristics . . . will have a powerful constitutional alterative effect, in concert with the system of hygiene, in preventing the formation of tubercle in the blood?

Bird's book gives us a contemporary view of the pathology of tuberculosis which it is germane to consider. In the emphasis on temperament and diathesis in his writings, we see the final lingering of humoral theories not long before their overthrow by the work of Pasteur, Koch and Lister. His graphic portrayal of the physical and mental attributes of the person prone to phthisis irresistibly brings a picture of Shelley to mind. Those of sanguineous or nervous temperaments showed particularly remarkable improvement during the voyage to Australia, especially those who were "wasting, with quick circulation . . . and a tendency to active congestion and hæmoptysis"—scarcely the picture of a desirable emigrant. In those of bilious or phlegmatic (lymphatic) temperaments the benefit was less obvious but perhaps more lasting. The "decidedly beneficial" effect of seasickness in the latter types was due to the relief of thoracic and abdominal congestion.

Contrary to the notion of many eighteenth century physicians, Bird considered that consumption was not a local affection of the lungs, but "a variety of a great class of disease of the blood"—that is, a generalized morbid process, in which the lungs were "only the stage on which it plays its most important part". Local remedies and measures to avoid bronchial irritation or to quiet the circulation were thus of subsidiary importance; shutting the patient up in a warm room, bleeding him, starving him and torturing him with counter-irritants were therefore therapeutic procedures of a bygone era. The two essential principles of modern treatment were, he said, "the reversal of those circumstances, conditions or habits of life under which the disease made its appearance, and . . . the immediate institution of such a hygiene and regimen as we know . . . to be the best suited to the preservation of health in a person already well". Upon these principles Bird based a rational system of management which, even if slightly strenuous, is not wholly outmoded today. However, an appropriate change of climate served a specific purpose through its "powerful constitutional alterative effect", a more fundamental approach, in his view, than that of most physicians, who saw only a possible benign influence of a certain characteristic (temperature, dryness, moistness, prevailing wind, for example) upon the local or pulmonary manifestations of the disease. A change of climate meant much more than the mere avoidance of an English winter. Apart from any special value of the Australasian climate, the long, complete break from work and worry inseparable from a voyage to the antipodes was psychologically more satisfactory than a visit to southern Europe, which could be monotonous, irritating and frustrating. Apparently Melbourne during the gold era was not productive of these emotional reactions.

On the possibility that the disease might become arrested, a point very relevant to the question of therapeutic emigration, Bird wrote:

The dried up cretaceous particles which we sometimes see in the lungs of patients who have died from other causes are evidence that tubercle has been formed in their blood and deposited in their lungs, but from some great and notable change in their constitution, has remained there . . . as a simple foreign body . . . In fact, the blood threw out the tubercle into the lungs, whose office is that of an eliminator of refuse and morbid matters.

Throughout his work there is no hint of the contagious nature of phthisis.

It is of interest to compare Bird's views with those of Brown,¹⁰ who published "Australia for the Consumptive Invalid",⁽¹⁰⁾ highly commended by at least one British reviewer,⁽¹⁰⁾ two years later. Brown regarded change, a long sea voyage and a desirable climate, in that order, as the important factors in the treatment of consumption. The climate in Australia could not be "what Dr. Bird would have us believe", for he (Brown) "was literally horrified, both in Melbourne and Adelaide, to see in the hospitals almost every other bed in the medical wards tenanted [sic] by a patient more or less advanced in consumption".¹¹

William Thomson and the Alleged Value of Taking the Cure in the Colonies.

Far stronger criticism of Bird's work was to come. In a trenchant review of his book,⁽¹²⁾ Bird's optimistic view of the role of the Australian weather was assailed by William Thomson,¹² a veteran of some six voyages to Australia and of almost a decade of practice in Melbourne. Thomson claimed that climate produced no effect, beneficial or otherwise, upon the disease, which he believed to be contagious. "The recommendation of Australia will be adopted only on its intrinsic merits", he observed, adding perhaps his most inaccurate conclusion: "It will be a long time before a sixty or seventy days' voyage will become fashionable." Thomson compared the ill effects of Australian winds with those produced by a north-easter in Brighton, a *mistral* in Florence or a *tramontana* in Rome.

Thus Thomson touched off one of the most remarkable medical controversies of the nineteenth century. Always fervid and at times intemperate,¹² it involved not only leaders of the profession and the medical Press at either end of the world, but also the lay public and the newspapers. In the way of protracted controversies the issues in dispute became wider or subtly modified, and hence confused, with the passage of time; but in the main it was Koch's discovery of the tubercle bacillus and its role in the causation and spread of the disease which brought discussion to a timely close.

¹⁰ Isaac Baker Brown; flourished about 1860; a surgeon-superintendent in the emigration service and the son of the prominent British gynaecologist of the same name.

¹¹ The immediate effect of Bird's book was highly significant. A review in *The Lancet*⁽¹⁰⁾ pointed out that "our notions of the great colony have been rather vague, and of its influence upon consumption we have heard little or nothing. . . the conviction takes strong hold of us that, were we suffering from incipient phthisis, it would take much to prevent our testing personally the truth of what he narrates so pleasantly". Bird himself stated that the book had been "the means of inducing a considerable number of invalids to undertake the voyage".⁽¹⁰⁾ Indeed, within three years of commencing practice in Melbourne, he was able to report in *The Lancet* the results of taking the cure in the Colony in a series of 47 private patients. Of 22 with cavitation, he considered eight to have been cured; five were improving and the rest had not benefited. Of 24 with less well-established disease, 20 had been restored to perfect or near perfect health. On these findings, it is interesting to note, he did not regard advanced disease as a contraindication to travel. With other authors, he thought hæmoptysis an indication for a sea voyage, an observation which in part reflects the natural history of tuberculosis and also probably of bronchiectasis.

¹² William Thomson, F.R.C.S.E., F.L.S., 1819-1883, was educated in Glasgow. Sometime editor of the *Australian Medical Journal*, he is noted for his ceaseless advocacy of the contagionist doctrine and the germ theory in regard to typhoid fever and other diseases; the undoubted value of his work was partially obscured by bitter, often personal, argument. An outline of his life and work is given by Gandevia (*Med. J. Aust.*, 1953, 1:398).

¹³ More particularly in Melbourne, where perhaps the peak was reached in 1869 at the time of the death of a British parliamentarian, Edward Denison, a few days after his arrival; while Thomson and others believed that he died of phthisis and hæmoptysis, Bird said death was due to scorbutic hæmorrhage from the nose. Denison was thirty years old, and had undertaken the voyage for the sake of his health and to study colonization. (*Dict. Nat. Biog.*). The Melbourne Age, which gave prominence to this tragic event and the ensuing controversy, observed that at least only "early cases" should be sent to Australia (January 29, 1870).

Thomson himself began an extensive statistical survey of phthisis in Victoria, which received "nearly all the Australian sent invalids", the results of which were published in a series of books and pamphlets between 1870 and 1882.¹⁴ Thomson's studies confirmed his view that the transportation of consumptives, if we may use that term, was damaging to both the individual and the nation; but, more significantly, they also led him to an understanding of the role of contagion in the spread of tuberculosis, and ultimately (1876) to an unequivocal and rational explanation of the pathology of tuberculosis in terms of causation by micrococci.⁽¹⁵⁾ Thomson also appreciated that the large-scale entry of infected emigrants into a relatively isolated population of changing age constitution was a human experiment which offered Australian doctors a unique opportunity to make a worthwhile contribution to knowledge concerning the aetiology and epidemiology of phthisis.

Thomson stressed the need for the appropriate selection of patients to make the long voyage, a point which had not escaped Sir James Clark, but which was largely forgotten in later years. Of 105 non-accidental deaths at sea on the outward voyage, between 1871 and 1874 inclusive, 50 were certified as due to consumption and about 25 others to hæmoptysis, debility, atrophy or throat disease. Of this period an English doctor wrote⁽¹⁶⁾ of Melbourne:

I found that most passenger ships from England have had deaths from phthisis at sea or land patients . . . to die in a few weeks or months far from home and friends.

British authorities replied that dying patients and their relatives had such faith that they often insisted on a long sea voyage against medical advice, thus giving the impression that cases were poorly selected.⁽¹⁷⁾⁽¹⁸⁾ In any case, Thomson considered the mortality excessive; twenty years later patients with much too advanced disease were still being sent out.⁽¹⁷⁾⁽¹⁸⁾⁽¹⁹⁾⁽⁴⁰⁾⁽⁴¹⁾ With some authorities in Britain he conceded that a sea voyage might be helpful when the disease had passed the active phase.

From Thomson's data it can be calculated that in Melbourne and suburbs about 1% of all deaths from phthisis occurred in emigrants within a month of arrival, another 2% within six months, and a total of about 5% within the first year. These figures relate to a five-and-a-half-year period, 1865 to 1870, when about 1850 of a total of 2143 deaths from phthisis occurred among emigrants; the population of Melbourne at this time was about 175,000.¹⁴

In 1863, the year in which Bird wrote, the mortality from phthisis in Melbourne and suburbs was 24 per 10,000 persons living, or about the same as in England and Wales, with a similar overall population density. In 1871 the death rate was 18.8 per 10,000 "non-Victorians" and 2.4 per 10,000 Victorians. The figures for 1878 were 21.9 and 4.4 respectively, the increase in the latter being chiefly among young adults. A similar trend was apparent in the previous decade. We may reasonably conclude, in spite of the limitations of these figures, that climate showed no obvious effect on overall mortality, that it did not prevent a definite mortality amongst emigrants, either new or old, and that it had not prevented the disease from increasing steadily amongst the native colonists, more especially in the young adult population.

¹⁴ Detailed reference to Thomson's numerous publications is not made in this paper. The bibliography prepared by Professor E. Ford should be consulted.⁽⁴²⁾ It should be noted that the 1879 edition of "On Phthisis and the Supposed Influence of Climate",⁽¹⁵⁾ which is important in the present context, is in effect a new work, quite different from earlier works of similar title. Thomson cites many useful references to the effect of climate on tuberculosis which are not all included in the present study.

¹⁵ The extent of the problem may be further illustrated by the fact that there were nearly 10,000 deaths from phthisis in the Colony in the third decade of its existence (1861-1871), the deaths occurring at a rate of about 12 per 10,000 persons living (20 per 10,000 in Melbourne and suburbs). Shortly after this, it was estimated that about one death in three of males aged 20 to 35 years was from phthisis. During the decade mentioned, phthisis overshadowed accidents as the most frequent cause of death, the nearest rival being atrophy or debility, a label which was probably applied to many cases of tuberculosis.

Thomson observed "... they change the sky, not the body, who go beyond the sea", an oblique reference to Bird's "alterative constitutional effect".

A final tilt at Bird may be mentioned; it was perhaps less deliberate, for Thomson was never intentionally humorous. In 1879, while Bird was still most active, Thomson wrote:

Of the host of phthisical doctors who were at one time boastfully said to be working hard at practice [in Victoria] . . . where are they now? Have not they all succumbed to phthisis within the five years . . . the limit to the imported disease?

There were four doctors among Bird's 47 patients previously mentioned.²¹

The Era of Uncertainty.

Thomson's arguments and conclusions were by no means generally accepted in the Colony; they certainly failed to convince Bird. Questions of personality and of local medical politics, in addition to genuine differences in the interpretation to be placed on the data available, influenced the report of a select committee²² of the Medical Society of Victoria, from which Thomson had not long since been expelled during a heated controversy. This report (1877) denied an increase in the mortality from phthisis in Victoria (in fact, the upward trend in the crude mortality rate was to become more obvious over the ensuing decade), attributed the apparent increase among young adults "to the influx of phthisical persons from abroad", and referred²³ to the "comparative immunity among those born in the Colony".²⁴ Singleton²⁵ reached similar conclusions at this time,²⁶ nor had he modified them by 1891, when his paper was reprinted with his autobiography.²⁷ He wrote:

It may with confidence and truth be made known to the world, that Victoria is not excelled, if equalled, for salubrity by any other country, more particularly as a means of preservation from phthisis . . . especially among the native born . . . Victoria may, ere long, become even more of a sanitarium [sic] to less favoured countries . . .

Singleton was a deeply religious and humane man, ever anxious to render spiritual and physical help to the afflicted. He, among others, drew attention to the comparatively low mortality from non-tuberculous chest disease in Victoria; especially in view of the difficulty of accurate diagnosis, the comparative infrequency and benign course of some of these conditions relative to English experience added strength to the impression that the climate favourably influenced the course of phthisis.

Physicians of the period in Britain were not well informed as to the prevalence of phthisis in Victoria or, in all probability, as to the subsequent fate of their patients. In view of the conflicting reports quoted above, it is not easy to see how this could have been otherwise, although Hirsch, writing before 1886, realized that Australia's reputation had been overrated.²⁸ Nonetheless it seems that their continued advocacy of therapeutic emigration was based upon tradition, upon the doubtful and perhaps irrelevant results of Continental travel, upon a belief in the specific value of certain climates, and upon a misconception, certainly common, that phthisis was rare in Australia. Reeves,²⁹ in writing of consumption in Australia after thirteen years in Melbourne, said that when he arrived, in 1861, he was "surprised to find how large a number of cases in the Hospital were suffering

from Disease of the Chest, particularly as I had been led to believe in England that it was unknown here".³⁰ Reeves believed that the climate was decidedly more favourable for consumptives in Victoria unless the patients had to work to earn their living, in which case they relapsed—another indication that taking the colonial cure was not confined to the privileged few. A later author observed that "the middle class or poor consumptive was told that he can find a healthful climate and occupation in Australia . . . but too often in the search for one he loses the other",³¹ by which was implied a lack of appreciation of colonial social conditions.

Colonial authors also criticized their colleagues at home for their ignorance of the Australian climate and of the extreme variation between, for example, Tasmania and Queensland. Newmarch³² wrote that "the ideas of climate as formed at home are, to say the least of it, extraordinary".³³ It was a "ghastly fact" that advice to the consumptive was too often based on the inaccurate accounts of short-term visitors or, in modern parlance, tourists. As early as the mid-nineteenth century European authorities such as J. H. Bennett³⁴ and Scoresby Jackson³⁵ began to express faint doubts as to the specific value of climate in the treatment of tuberculosis. Austin Flint³⁶ more dogmatically and reasoned statement to this effect followed in 1875.³⁷ These views meant that a full knowledge of the Australian climate was even less of a therapeutic necessity and that ignorance of its vicissitudes was more likely to occur.

The Ocean as a Health Resort.

Dr. William Wilson's Views.

Whatever the opinions as to the specific effects of specific climates, there was almost complete unanimity throughout the century on the value of "change" in the treatment of phthisis. For this reason, as well as the purity of the air inhaled at sea, the popularity of sea voyages remained unabated; even an Australian developing the disease was advised to undertake one.³⁸ Indeed, it became the fashion for a whole host of ills, requiring the production of practical handbooks of the sea for the invalid. One such, entitled "The Ocean as a Health Resort", came from the pen of an English doctor, William Samuel Wilson.³⁹ This interesting period piece of medical sea-literature was designed as a vademecum for the traveller in search of health, and it described voyages to all quarters of the globe, giving details of the ships, agents, conditions of sea life, discussing steam as opposed to sail, and providing much information on the effects of travel upon various diseases.⁴⁰ Wilson's personal experiences of shark and dolphin may be somewhat of the nature of travellers' tales, but his precepts in general were sound and convincing. He was very informative about the ships themselves and about the life and customs thereon. His details included descriptions of the ceremonies of "crossing the line" and "burying the dead horse"—a farcical procedure undertaken by the sailors on the twenty-eighth day out on the homeward voyage—as well as the organization of saloon games and amateur theatricals for the passengers; his wise precautions were many, and include this pleasant understatement:

Whenever the officers advise the ports to be closed, the passenger should on no account be tempted to re-open them, for the inconveniences of getting a sea into the cabin are far greater than the temporary deprivation of fresh air.

Wilson enthusiastically recommended sea-voyaging for its curative effects, especially in cases of consumption, with the admonition that "the one great point is to take the

²¹ The members were John Singleton, John Williams, Tharpe Mountain Gridlestone and James Jamieson.

²² It is difficult to explain this conclusion except on a basis of bias due to existing personal and medico-political feuds. It is refuted by the statistics of Thomson and of the Government Statist, and by the published experience of others already quoted.

²³ John Singleton, M.D., died 1896, came to Melbourne from Ireland, and is best known for his indefatigable social work and as a co-founder of the Children's Hospital, Melbourne.

²⁴ Charles Evans Reeves, M.A., M.D., died 1880, was editor of the short-lived *Medical Record of Australia* and author of several essays on diseases as encountered in Australia.

²⁵ Bernard James Newmarch, L.R.C.P., M.R.C.S., flourished 1880, practised in Melbourne and Sydney after his emigration.

²⁶ John Hughes Bennett, 1812-1875; physician and pathologist at Edinburgh.

²⁷ Robert Edmund Scoresby Jackson, 1834-1867, Edinburgh physician.

²⁸ Austin Flint, 1812-1866, Harvard graduate and New York physician, noted in his day as much for his work on pulmonary disease as for his cardiological studies.

²⁹ William Samuel Wilson, L.R.C.P., M.R.C.S., 1839-1882.

disease early". So spoke Celsus nearly two thousand years before. Bronchitis, asthma, nervous complaints, joint diseases and overwork were noted by him as conditions responding well to sea travel, with the warning "at the same time, those who take a voyage, whether as invalids or otherwise, must not fall into the mistake of looking upon the sea as a panacea for every ill, but must make up their minds to face many inconveniences and even dangers in their ocean life".

Descriptions are influenced by opinions in these matters. Bird said of the better vessels that "an invalid may be as comfortable as in his own home. The first class cabins are spacious and lofty, and each has a window three feet square. The table is kept in the style of a first class hotel, and to such perfection has the art of preserving fresh vegetables attained . . . that one fares as well in

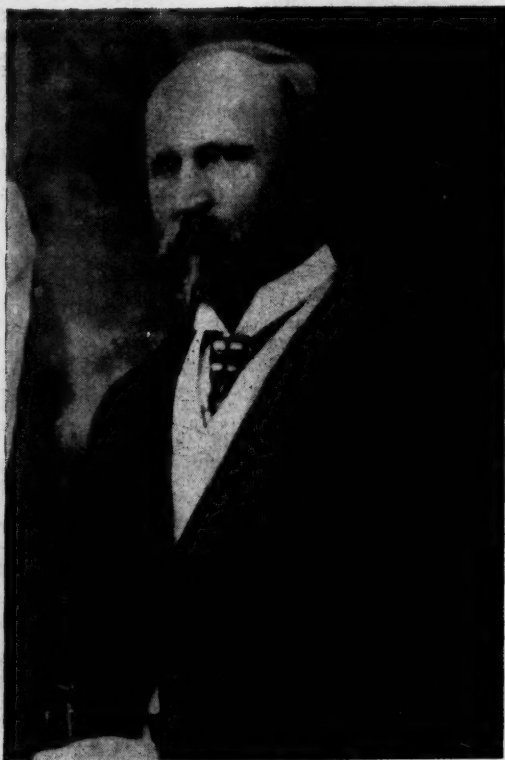


FIGURE I.

Dr. Francis Workman, circa 1890; from a family group.

mid-ocean as in port". Thomson, on the other hand, referred to the "floating hospitals" as, in certain instances, "deep-laden barges with flooded cabins and swept decks . . . ill-adapted for the sick".

Dr. Francis Workman's Views.

The story of an English provincial doctor who was influenced by Wilson has recently been recovered. Francis Workman (Figure I) was a medical practitioner in Reading, and assistant surgeon to the Royal Berkshire Hospital in that town. He was the son of Dr. Thomas Skete Workman, of Reading, and a descendant of the surgeon to the first Duke of Wellington. After training at King's College Hospital, where he must have been nearly contemporary with Bird, he qualified as a member of the Royal College of Surgeons in 1855 and a licentiate of the Society of Apothecaries in 1856. He went into partnership with his uncle, John Woodroffe Workman (M.R.C.S., 1830). In 1864 Francis Workman was sec-

retary of the Reading Pathological Society, one of the oldest societies of this character in the provinces. This function he fulfilled for nineteen years, and at various times he showed clinical and post-mortem specimens to meetings of the Society. In 1883 Workman himself began to suffer from ill health, and contemporary local newspapers record presentations made to him prior to his departure for Australia. He received a case of operating and eye instruments from the Reading Pathological Society, with a clock³⁵ and "a very handsome and valuable travelling bag fitted up in a complete manner" from other societies.³⁶ His wife and son,³⁷ who accompanied him, also received presents, the latter being given a "case containing several useful articles" by the Reading Club, which was described as a "small select society".

Beyond the fact that he had symptoms of phthisis, no details are known of Workman's illness. He was, in 1883, 50 years of age. In Melbourne he took an active part in medical life for some ten years. He practised in West Melbourne, where for a time he was public vaccinator. In 1893 he was found to have a rectal cancer, but he continued work for two more years. After his wife's death in 1896 he moved to Hamilton; the last months of his life were spent as medical officer to the Hamilton College, of which his son had recently become headmaster. He died on August 23, 1897.

In May, 1884, five months after his arrival, he was elected a member of the Medical Society of Victoria. Although attending regularly, and once receiving the Society's formal support in an ethical controversy, he took only a minor part in its proceedings. His most notable contribution was made in 1887, when a case of intussusception was presented by Dr. Snowball,³⁷ who had operated on the patient at Workman's request.³⁸ The successful outcome, perhaps the earliest in the Australian medical literature relating to this condition, was largely attributable to Workman's early and accurate diagnosis. The case is reminiscent of one, in a boy of fourteen, which Workman had communicated some years earlier to the Reading Pathological Society;⁴⁰ autopsy had shown strangulation at the duodeno-jejunal flexure caused by a band.

Workman's 84-day voyage to Melbourne commenced on September 20, 1883, when he sailed as ship's surgeon on the *Sobraon*. He himself tells his story in a letter written to the president of the Reading Pathological Society. This was published as a pamphlet⁴⁰ by the Society in 1884, the same title being used as Wilson had used four years earlier.⁴² Copies are extant in the library of the society and in the Reading Public Library, and a photostat copy is preserved in the Museum of Medical History, Medical Society of Victoria (Figure II).

Workman's letter provides us with a picture of his three months' experience of life on "a so-called hospital ship". The *Sobraon*⁴⁰ (Figure III), one of Messrs. Devitt and Moore's Australian packets, had been described by Wilson in detail as a fine three-master characteristic of her type. She was built in Aberdeen in 1866, of teak and

³⁵ Workman is reported to have said that the clock would be handed down as an heirloom, and indeed it still keeps perfect time in his grandson's home in Melbourne.

³⁶ The son, Andrew Skete Workman, M.A. (1864-1914), returned to Oxford, but rejoined his family in 1885 on taking up appointment as classics master at Melbourne Church of England Grammar School. His wife and son are still living; his death in 1914 was due to the disease which caused his father's migration.

³⁷ William Snowball, M.B., Ch.B. (Melbourne), L.S.A., died 1902; for a time at Great Ormond Street, he became resident medical officer at the Children's Hospital, Melbourne; he subsequently built up an extensive consultant practice.

³⁸ Curiously enough, this was probably not the only work published by a surgeon of the *Sobraon*. "Voyaging for Health", by H. M. Doyle, M.R.C.S., of Newcastle, New South Wales, is believed to describe a later voyage (E. Ford, personal communication), but no copy of this work has been traced.

³⁹ After 1892 the *Sobraon* became a familiar sight in Sydney Harbour, first as a reformatory school and later as the Royal Australian Navy's training ship *Tingira*. After more than a decade of idleness and after the failure of attempts to secure her preservation, she was broken up in 1940.

iron, the largest "composite" ship ever built according to Scot Skirving.⁴⁰ Launched as a tea-clipper, she was soon transferred to the passenger service, where she "was always a great standby for English doctors who wished to send patients on a long sea-voyage" on account of her comfort and spaciousness.⁽⁴⁶⁾ She proved an excellent sailing ship, although never driven hard out of consideration for her passengers (Figure IV). Even so, her fastest trip to Melbourne was made in only 68 days, and most of her outward passages were between 70 and 80 days.⁽³⁷⁾ She was of 2100 tons registered burden, length 300 feet, and carried an area of over 7000 square yards of canvas on her three masts. Workman says she realized one's idea of a gallant ship and was very fast. However, her length and narrowness of beam caused her to roll a

The diet was stated to be fairly good, but limited and monotonous, in spite of tinned vegetables, ice, and the presence on board of two cows; invalids had a glass of milk at 7 a.m. and 4 p.m. Livestock were always carried on these ships. Faber, in 1876, had stated that "the ship's cow which figures daily in the shipping advertisements, side by side with the stewardess and the 'experienced surgeon',⁴¹ supplies milk which is not of very good quality".⁽³⁸⁾ Alan Villiers records that the *Sobraon* carried three bullocks, three cows, 90 sheep, 50 large hogs and a number of sucking pigs, and between 300 and 400 fowls, ducks and geese.⁽³⁹⁾

Workman was very critical of the arrangements made for the reception and treatment of the sick. As ship's surgeon he inspected his materia medica before sailing and found that it was limited to an ordinary sea-captain's chest. As he was informed that his position was something of a sinecure, that all the patients would be convalescent, he added little to his stock and, in the event, found it wanting. The *Passengers Act* of 1855 provided for a hospital room to be kept free on all large vessels. Faber had not seen one on any ship,⁽⁴²⁾ and there was certainly no provision of this sort on the *Sobraon*.

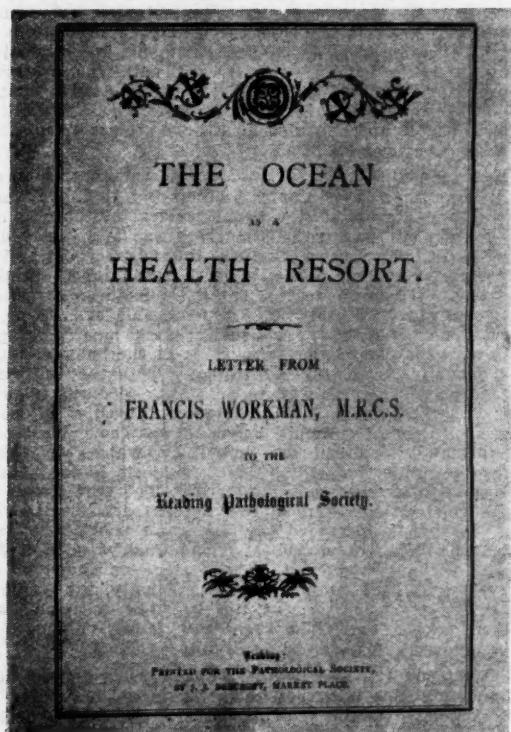


FIGURE II.

Title page of Francis Workman's pamphlet.

good deal. These were the characteristics which gave her fast sailing properties, and, as regards rolling, it must be remembered that Workman was a landlubber. The *Sobraon* carried 84 first-class passengers and over 40 second-class. She was commanded from 1867 to 1891 by Captain J. A. Elmslie, described as a "kindly master", whose name, with that of his ship, was a household word in Sydney and Melbourne. His son, A. G. Elmslie, also served on her from 1880 to 1891 and was third mate on Workman's trip.

According to Workman, *Sobraon* was well officered, and the stewards who had to attend upon the sick were obliging, although too few. The stewardess, however, was "a nonentity . . . a respectable woman who worked her way out, and save that she attended a paralytic lady as her maid part of each day, I never heard of her doing anything on board, save tatting. A lady died in the tropics, and an infant was born . . . and she did nothing on either occasion".

* Robert Scot Skirving, M.B., C.M. (Edinburgh), F.R.A.C.P., F.R.A.C.S., F.R.C.S. (Honorary), 1859-1956, Sydney surgeon and physician; an experienced sailor and a former surgeon of the emigration service.

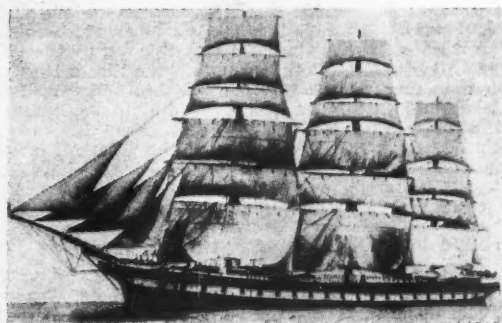


FIGURE III.

The square-rigged three-master *Sobraon*. Reproduced by permission from "The Colonial Clippers" by Basil Lubbock.

Workman noted the difficulty and embarrassment of examining patients on the open deck; he dispensed from his chest placed on the main hatch, "under the critical eyes of the stewards and passengers". He eventually succeeded in having a screen rigged. He complained of discovering, too late, that three-quarters of the passengers were in fact ill people, with complaints ranging from simple dyspepsia to the last stage of phthisis, and armed "with all manner of prescriptions" from "all manner of physicians". No effort had been made to assess the suitability of the voyage for individual patients. One man was landed at Plymouth, the ship's last port of call, with "extensive cavities in both lungs, laryngeal phthisis, swollen legs, and a heart fluttering like a reed". Appeals to the captain and the agent were of no avail, as they had no wish to be involved in actions for breach of contract. Workman succeeded in persuading this unfortunate man to leave the ship only by assuring him that the journey

⁴¹ Otter (1872)⁽³⁵⁾ gives a distressing account of this amenity. An oldish gentleman sitting next to him at dinner, shortly after he had boarded his "hospital ship", was obviously very ill, "apparently far gone in consumption: there were other gentlemen travelling for their health, but my next neighbour seemed very far the worst. . . . He was the 'experienced surgeon' who was to look after us invalids". The doctor's condition deteriorated so markedly that he had to be put ashore at Falmouth. The next day at dinner "we discovered that our new surgeon was far from sober; and his intemperance grew daily worse and worse . . . he was perfectly incompetent through drink to do anything whatever. . . . The other advertised comfort, the cow, performed her duties to our entire satisfaction". Otter's own health improved slightly (though less than his doctor in Melbourne would have expected), so that with certain reservations he was not wholly opposed to the voyage as a therapeutic measure. Nonetheless, he met many travelling invalids in Australia and knew only one who made any real advance to health.

would merely accelerate his end, and in fact he died on shore one week later.

Workman was distressed that this man was to have shared a cabin with a nervous and dyspeptic youth named Andrews, from Aldermaston, Berkshire. In another instance he advised a young man to have a hammock slung outside rather than "encounter the pestiferous exhalations" of his cabin mate, who was in the third stage of consumption. One such patient died a distressing and delirious death on the journey after a fall which was alleged to have caused a pneumothorax.

"Of a truth", wrote Workman, feelingly, "I saw plenty of reason to decide that if a ship is a pleasant place (for those who like it) to live in, it is a most wretched place to die in. . . ." These words echo those of Fullerton,⁽²⁾ who had made six such voyages, written the year before:^(2b)

It requires one to have witnessed their suffering to be able to sympathize sufficiently with poor invalids, tossed about by the merciless billows, half starved by reason of the solid sea fare . . . and nauseated by the sight of . . . any fluid food that can be got on shipboard.

Workman, too, wrote from experience, for there were three deaths on the voyage (two from phthisis) and one suicide by drowning; the suicide was that of a young lady of 18, the daughter of an eccentric bibulous mother. This episode is corroborated by a verbatim report⁽³⁾ given by the third mate, A. G. Elmslie. Both accounts agree that a boat was lowered in four minutes, but as the ship had travelled a good half-mile in this time, and as the night was intensely dark with a heavy sea running, there was little hope of picking up the girl. No reason could be produced for this sensational event, and no inquiry appears to have been held. "The sea", wrote Workman cryptically, "is a dangerous place to send romantic, impulsive young ladies to." Lubbock remarks that she was the only person lost overboard in the whole career of the *Sobraon*.⁽⁴⁾

A somnambulist who gave a little trouble by scaring other passengers was also mentioned by both Workman and Elmslie. He was treated with a douche bath—presumably of sea-water—and Easton's syrup with bromide at night. This relieved him, as did the use of a magnetic battery, and he was in tolerable health on landing.

A pathetic case described at some length was that of a young man with disseminated cerebro-spinal sclerosis of two years' duration, who developed paraplegia, with paralysis of bladder and rectum, and with bedsores of sacrum and hip. Workman gives great credit to the stewards, who, amid other duties, nursed him day and night in a confined cabin on a narrow bunk. He was transferred to the Alfred Hospital, Melbourne, and died there a week after landing.

Workman summed up by writing of his conviction that it was a great mistake to send to sea for a long voyage invalids who were not convalescent; the patient was committed, once afloat, to a novel form of treatment lasting three months, however much he might hate it or however little it might suit him. "Australia or death is the word" was the way in which he put it. For those whose lungs were affected with tubercular deposits, the risk from cold, sea-sickness or tropical heat decidedly outweighed any prospect of benefit. These, it may be recalled, were the words of one who was also a *poitrineaire*.

The subsequent history of the phthisical patients aboard the *Sobraon* was described by Workman in 1886 during discussion at a meeting of the Medical Society; by a strange quirk of fate, the meeting had listened to an address by S. D. Bird entitled "On Some Phases in the History of the Treatment of Pulmonary Phthisis during the Last Twenty-Five Years".⁽⁵⁾ No less than twelve patients had died within six months of their arrival, two or three "improved decidedly" (one was presumably Workman himself) and the remainder were as bad as if they had stayed in the United Kingdom. Thus, among

the 124 passengers aboard the ship, over 11% died from pulmonary tuberculosis within nine months of embarkation, although by no means all the voyagers had "taken the cure" on account of this disease. It is recorded that on an earlier trip by the *Sobraon* (1879), 10% of passengers were "very far gone in consumption", many later dying of the disease, so that Workman's experience was not unique.⁽⁶⁾

Epilogue.

The curve of Victorian mortality from pulmonary tuberculosis, which was in general consistently higher than that for other States, shows a small, abrupt peak in 1860, followed and far overshadowed by a steady rise from about 1865 to a maximum shortly before 1890. Thereafter there was a steady decline to the modern era, such that the death rate had more than halved within a quarter of a century. The explanation of the first peak lies partly in the classification of phthisis with pneumonia and bronchitis prior to 1862; but it is in accord with the available information to suggest that it was partly caused by the deaths of frankly phthisical emigrants. The combination of health, gold and sunshine must have seemed irresistible in those early years.

Of the ensuing steady rise, we can be more confident as the cause. As Cumpston^{(2b)(6a)} and Holmes^(6b) have pointed out, it coincided with the arrival of the children of the gold era (when the birth rate was high) at young adulthood and with a further influx of young adult migrants. Not only was the death rate highest in this age group (20 to 35 years), but there is incontrovertible contemporary evidence, both clinical and statistical, to show that the disease was usually of the acute, progressive, often pneumonic type occurring in the "non-immune" young adult. It was, indeed, in many instances "galloping consumption". To this rising mortality, doomed tuberculous migrants doubtless contributed directly in some measure. More important, however, was the explosion of the legend of colonial-born immunity, which took place when the proportion of susceptible subjects in the population rose to a sufficiently high level. The part played by the phthisical emigrants in this connexion is less certain. No doubt they increased the "infective pool" at a time when the mode of spread of the disease was ill understood; perhaps without them the slope or shape of the curve might have been different.⁽⁷⁾ Finally, the contribution, direct or indirect, of the would-be escapists, who came because they had such bad family histories of tuberculosis, can never be accurately assessed.

The steady fall in mortality since 1890 is due to many factors, probably the most important initial one being the achievement of stability of age constitution of the population, the age distribution becoming similar to that of older countries. The large group of susceptible young adults disappeared, and mortality in males became highest in older age groups. Other factors operative at the turn of the century were the improvement in social conditions and public and personal hygiene together with an increased awareness of the mode of spread of the disease, although at least the lecturer in medicine at the University of Melbourne was not easily convinced of the role of germs.⁽⁸⁾

Of the emigrants themselves, some, we hope, fared better than they might otherwise have done; some, we believe, fared worse. Some found a new life in a land of opportunity; some met a lonely, friendless death in a hospital or a cabin, a tent or an inn. A contemporary view (1899) was that "hecatombs of patients have been sacrificed to the idea that only a sea voyage is needed to put them right, and that on landing in a new country they will get health and wealth without the necessity of working

⁽²⁾ George Fullerton, C.M., M.D. (Edinburgh), flourished 1880; sometime physician to the Sydney Infirmary and Benevolent Asylum.

^(6a) The mortality peak in Victoria, which received most tuberculous emigrants, occurred five to ten years later than in other States, but the significance of this finding is not clear. Differences in age constitution and immigration rates may have played a part, and so may the rapidly rising incidence of miner's phthisis (silicosis with or without tuberculosis) in Victoria which followed the introduction of machine rock drills about 1875.

for it".⁽⁶⁵⁾ In the 1860's, 15% of deaths from phthisis were among emigrants of less than five years' standing. Three-quarters of a century later the figure was between 2% and 3%,⁽⁶⁶⁾ which is perhaps high enough, in relation to the migration rate, to make it possible that the practice of taking the cure in the colonies had not wholly gone out of favour. The basic factors in its loss of popularity were a better appreciation of the natural history of tuberculosis and the emergence of rest as the dominant therapeutic principle; a secondary factor was the declining faith in the specific effects of climate, sea and air.

The role of climate in the management of pulmonary tuberculosis nevertheless continued to be argued until the advent of effective chemotherapy and surgery rendered

ago; the present rising proportion of susceptible young adults in her population is protected, at a time of intensive immigration, by radiological "screening" and by B.C.G. vaccination. In Britain, by contrast, there is a hint of concern at the "epidemiologically significant" proportion of cases of "open" pulmonary tuberculosis among migrants from Ireland reaching London.^{(73) (74) (75)}

Acknowledgements.

We should like to thank the descendants of Dr. Francis Workman, both in England and in Australia, for their generous cooperation. We have drawn upon some manuscript observations upon matters of fact in the history of tuberculosis in Australia given to one of us (B.G.) some



FIGURE IV.

Passengers aboard the *Sobraon* on a voyage to Australia circa 1890; the party includes the surgeon, Dr. Doyle, but he has not been identified. It has been suggested that the passengers' appearance lends strong support to the term "hospital ship" as applied to the *Sobraon*. (Reproduced by courtesy of the Mitchell Librarian, Sydney.)

the problem academic. W. Camac Wilkinson,⁽⁶⁸⁾ Duncan Turner,⁽⁶⁹⁾ W. R. Dovey⁽⁷⁰⁾ and J. W. Springthorpe, with his several contributors,⁽⁷¹⁾ were among Australian authors to continue placing emphasis on climate in therapy, although their views were not wholly uniform. The emphasis shifted from a comparison of English and Australian climates to the narrower problems of which Australian State was most favoured, which part of a State was preferable in each season, and whether sea or mountain air was more desirable; the practical point in question was where sanatoria should be built. In retrospect, Cumpston was unable to show any effect of climate, within Australia, from an analysis of mortality figures in Queensland and Victoria.⁽⁶⁰⁾ The physicians of yesterday, including many previously mentioned, who deliberately weighed the advantages of climatic change against the disadvantages, physical and psychological, of absence from home, family and working environment, would today find themselves in sympathy with those who advance almost identical arguments in favour of predominantly domiciliary management as against a sanatorium regimen.⁽⁷²⁾

So the wheel of history turns, never quite on the same axis, but often close enough to tempt us to identify a complete revolution. Today Australia can look back with equanimity upon the consumptive emigration of a century

years ago by the late Dr. J. H. L. Cumpston. On the other hand, except where his published work is specifically quoted, he is not responsible for any of the opinions expressed. We are also indebted to Professor Edward Ford for a number of valuable references, and to Professor K. F. Russell for reading the typescript.

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The list of papers on Australian medicine published in British medical journals prior to 1880, in course of preparation by Miss Ann Tovell, of the Museum of Medical History, Medical Society of Victoria, has proved most helpful.

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AN EXPERIMENT IN RESOCIALIZATION OF PATIENTS WITH LONG-STANDING PSYCHOSES.

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REPORTS are frequently coming to hand in which excellent results are stated to have been achieved with various resocialization procedures carried out with chronic psychotic patients. The purpose of this study was to evaluate the effects of an intensive resocialization programme on a group of those formerly thought of as "chronic" deteriorated schizophrenic patients from the closed "back wards" of the Kew Mental Hospital. Results were compared with the effects of routine ward management on a control group who were finally given a course of physical treatment. The results of intensive resocialization, routine management and physical treatment were ultimately assessed.

Experimental Design.

The Sample.

A survey of the patient population housed in the "back wards" of this hospital revealed a large number of low-grade mental defectives and grossly deteriorated epileptics. The remainder constituted a relatively homogeneous group of long-standing schizophrenics, who were selected as the parent population from which our experimental sample was drawn. Since the patients were widely scattered over a number of different wards, it was decided that a move to a common ward would be advisable. As both males and females were included in the experiment, this did, in fact, involve the selection of two wards as living quarters. Both were long-stay wards, typical of such wards in the hospital.

The advantages of this procedure are obvious. Patients in the control and experimental groups were as far as possible subject to the same ward pressures and were under the surveillance of the same nursing staff. Assessment of patients was thereby facilitated, since the same members of the nursing staff were involved in providing relevant information on the ward behaviour of patients. Patients in the experimental group could get together and discuss the experiences they had in common, thus perhaps reinforcing those experiences during the period when the programme was not in session.

Accommodating the experimental and control group in one ward could have one possible disadvantage—namely, the fostering of resentment in the control group against the preferential treatment of the experimental group, thereby adversely affecting the adjustment of the former. In the present study, any such effect was cushioned by the large number of patients (70 to 80) accommodated in the ward, the experimental group (10) forming only a small minority.

Fifty patients were provisionally selected and allowed a settling-in period in the new ward. Their behaviour was observed over a three-week period by the nursing staff, and at the start of the experimental period, ratings were noted for each patient on the Gardner Behaviour Chart (Wilcox, 1942). During this period, we interviewed each patient individually and assessed his condition, using a modification of the scale described by Rackow *et alii* (1953). The latter provided a basis for "matching" patients. Information, made available from the hospital files, provided details of age, marital status, duration of illness and history of previous treatments. As far as was possible, patients were matched on all these criteria.

Having finally selected 40 patients, 20 males and 20 females, we allocated 10 of each sex to an experimental group and an equal number to a control group. Criteria for selection were chronicity of illness, withdrawal and loss of contact with the environment, unemployability, and non-improvement over an extended period of time with various types of treatment.

The Programme.

The patients in the control groups continued to participate in the usual round of hospital activities. The same applied to the experimental groups, except that they, in addition, attended sessions over a period of six months in an attractive, open ward of the hospital. During the first three months, eight two-hourly sessions per week were arranged; in the final three months, the programme was expanded to include 11 two-hourly sessions per week. As a routine, a variety of different activities were arranged, including billiards, table tennis, various group activities, music, reading and occupational therapy. The detailed organization of activities at the two-hourly sessions was planned by the charge nurse in each ward, and was carried into operation by the nurse in conjunction with the members of the staff. Typically, there was a ratio of one staff member to every three patients. During the first three months, the male and female experimental groups attended sessions in separate wards; later some sessions were combined, and dancing and similar activities were encouraged.

The programme for the resocialization sessions should be seen against the usual pattern of activities in the long-stay wards of the hospital. Patients in such wards, while receiving good custodial care, are generally regarded as prognostically hopeless and treated as such. The wards in which they live are drab, unattractive and overcrowded; there are few or no facilities for recreation; patients, except when they are being bathed, dressed or fed, stand or sit about the ward or airing court. Against this background, the atmosphere in the open wards of the hospital where the resocialization sessions were held presents a welcome contrast.

At the end of the experimental period (i.e., after six months), a further feature was introduced. We were interested to compare results of the resocialization programme with the effects of a course of physical treatment. Selection from a multitude of pharmacological agents, insulin, electro-convulsive therapy, etc., presented some difficulties. It was finally decided to combine the ataraxic effects of E.C.T. with the most popular "tranquillizer"—chlorpromazine. During the following six weeks, the control groups were given nine sessions of E.C.T. followed by a course of chlorpromazine in increasing doses up to one gramme per day.

The Scales Used.

The Gardner Behaviour Chart.—The Gardner Behaviour Chart has 15 items. These cover a wide range of behaviour, including attention to personal appearance, sleep, appetite, sociability, various types of control, care of property, cooperation and work capacity and initiative. We believe that it is suitable for use by relatively unsophisticated persons, since all that is required is a fairly careful observation of the patient in his day-by-day activity. Five behavioural descriptions accompany each item. The rater is required to check the description which most adequately fits the patient. Each behavioural item has a numerical weighting from zero through four. Thus the maximum total score which can be awarded is 60 points, the minimum, zero points. A score of 60 represents "normality".

A Modified Form of the Scale of Rackow et alii (Scale II).—Rackow and his associates describe a "group method for the rapid screening of chronic psychiatric patients". The procedure involves two group sessions in which 10 or more patients are interviewed, typically by a psychiatrist and psychologist. The patients are asked, in rotation, a series of 10 standard questions, which are so designed as to elicit the information required for rating patients on the seven criteria of the scale. The seven criteria, each of which is rated from zero through four, are as follows: reality testing, emotionality, communication, human relations, aspirations, manifest overt behaviour and intellectual functioning. An operational definition of each is given as a guide in making the ratings. The total score provides an index of the social and interpersonal adjustment of the patient. A zero score indicates a patient who is psychically completely unresponsive to environmental stimuli; a score of 28, a patient who is suitable for the highest activity ward in the hospital, or for early planning for discharge.

We cannot claim to have used the scale in precisely the way intended by the authors. The scale was designed for group administration, and we used it not in group sessions but in individual interviews. If, as the authors claim, the scale measures the degree of the patient's ability to function in a social group, then, to the extent that in individual interviews no other patients are involved, we are not in a position to observe one important aspect of social interaction—namely, the relationship between patient and patient. We could only observe their relationship and response to us, and it was on this basis that the ratings were made.

Our decision to use individual interviews rather than group sessions as a basis for rating patients was determined by our initial evaluation of the patients involved. These patients, in the early stages of the experiment at least, showed little or no ability to function in a social group. Their attention could be

held, when it could be held at all, only in a situation in which one was dealing with the patient in a very direct and personal way. As soon as this immediate and close contact with the patient was lost, as was inevitable where a group of 10 patients was involved, no responses at all, or at least no meaningful responses, could be elicited.

Our ratings, then, are not strictly comparable with those which would have been obtained on a similar group by Rackow and his associates. It should be noted, too, that whereas the former based their ratings on two sessions separated by one week, and used their ratings as a basis for assigning patients to different wards of the hospital, we conducted seven or more interviews at monthly intervals with each patient (each of which was made the basis for a separate rating), and used these to provide an index of change over the period.

The Ratings.

Ratings on both scales for each patient, experimental and control, were completed before the experiment began, and thereafter at monthly intervals during its course. An additional rating was made for the patients in the control groups six weeks later, after the course of physical treatment.

The ratings on the Gardner Behaviour Chart were based on the patients' behaviour in the closed (parent) ward. They were completed by the nurses in charge of those wards. In addition, the nursing staff in both the open and closed wards submitted a written report on each patient at the end of the six months' period. These provided valuable supplementary information on the patients' mental and physical condition at this stage, and afforded a qualitative appreciation of the changes which had taken place during the experimental period.

Ratings on Scale II were completed by us after individual interviews with each patient. To minimize subjective bias, two judges were used. One of these (G.M.) was not on the hospital staff, and was interested in the project as a research investigation only. We experienced little difficulty in reaching agreement in rating patients on the various criteria.

Analysis of the Data.

We have two separate sets of data—the ratings on the ward behaviour of patients (Gardner Behaviour Chart), and our evaluation of the extent to which patients may still be able to make reasonably effective contact with their environment (Scale II). In the analysis, greater weight will be given to the ratings obtained on the Gardner Behaviour Chart for the following reasons: (i) we believe that the Gardner Behaviour Chart is the more objective, since it relies on direct behavioural descriptions and not, as does Scale II, on inferences drawn from the typically meagre cryptic and inadequate verbalizations made by the patient himself; (ii) we believe that in this situation, and as used by us, the Gardner Behaviour Chart affords probably the more valid technique. While the ratings on Scale II are based on behaviour in an artificially created situation, those on the Gardner Behaviour Chart reflect the patients' routine day-by-day activity.

The ratings on the Gardner Behaviour Chart and, in less detail, those on Scale II, have been analysed in a number of ways:

Changes in Individuals.

As a first step, we were interested to find out how many patients' condition improved, was substantially unchanged or became worse in each situation—i.e., after six months' participation in the resocialization programme, six months in which no treatment other than routine ward management was received, and six weeks of physical treatment.

Mean Gains between Groups.

The mean status of the experimental group at six months was compared with the mean status of the

control group at six months. It was possible that both groups had shown improvement, so that it was important to consider the gains made by the experimental group in relation to those made by the control group. Resocialization can claim to be successful only to the extent that the gains in the experimental group significantly exceed those made by the control group.

A further comparison was made between the mean status of the experimental group at six months and that of the control group at seven and a half months—i.e., after the latter group had received a course of physical treatment. If the mean gains in the experimental group significantly exceed the mean gains in the control group, then it can be claimed that, with this type of patient, a resocialization programme is more successful in effecting improvement than is physical treatment.

Mean Gains within Groups.

The comparison here was not the relative status of the experimental and control groups after a period during which the two groups had received differential treatment, but the comparison of the present status of a group with its previous status. The base line used in making the "within group" comparison was the initial status of the group.

In assessing the significance or otherwise of the various changes which occurred between and within groups, the statistical technique employed was the *t* test (Fisher, 1950). A change was accepted as significant when the probability of its occurrence by chance was in the ratio of 1:20 (the 5% level of confidence).

Results.

Gardner Behaviour Chart.

In assessing the changes which occurred on the Gardner Behaviour Chart, we have adopted the arbitrary position of considering changes within the range ± 2 as chance occurrences. Patients scoring within these limits were classified as "unchanged". When the change exceeded ± 2 , the patient was considered either "improved" or "worse", according, of course, to the direction of the change.

The changes discussed are those occurring in the interval between the initial (pre-treatment) and the final rating. For the experimental group and the control group (before physical treatment was implemented), this represents a period of six months. In assessing the changes which occurred in the control group as a result of physical treatment, the ratings at six months were compared with those at seven and a half months.

Table I summarizes this information.

It is evident that in each situation some patients improved, but that in general the females presented a less favourable picture than did the males. This is so when the male and female control groups are compared, irrespective of whether or not physical treatment had yet taken place, and is highlighted when the results in the male and female resocialization groups are compared.

Among the males, the response to the resocialization programme compared very favourably with the response to routine ward management and/or physical treatment. Among the females, the response was less specific. It is worth noting, however, that whereas the improvement rate in the female experimental and control groups showed little variation, no patient who participated in the resocialization programme became worse.

It follows that the results for physical treatment were disappointing. Physical treatment failed to produce more improvements than were effected in the course of routine ward management.

Figures I and II permit a more detailed evaluation of what took place in each group at each stage of the experimental period. The mean total score for the group is presented on the vertical axis of the graph. The horizontal axis indicates the time at which the rating was made. Analysis of the ratings of the experimental

TABLE I.
Changes in Individuals: Gardner Behaviour Chart.

Condition.	Males.			Females.		
	Experimental Group.	Control Group.	Control Group (after Physical Treatment).	Experimental Group.	Control Group.	Control Group (after Physical Treatment).
Improved ..	9	4	5	4	3	3
Unchanged ..	1	4	4	6	4	4
Worse ..	—	2	1	—	3	3

and control groups during the first six months affords a comparison of the changes which took place in the ordinary course of routine management (control group) and those associated with the resocialization programme (experimental group). At seven and a half months, the effects of physical treatment can be assessed and compared with those of the resocialization programme in the experimental group.

Among the male patients, those who participated in the resocialization programme stand out quite clearly from the controls. As is apparent, while the two groups were very closely matched at the beginning of the experimental period, they were very different at the end of the period. If the mean total score of patients who received resocialization is compared with those who did not (irrespective of whether or not they had yet received physical treatment), the difference in response is significant beyond the 1% level of confidence.

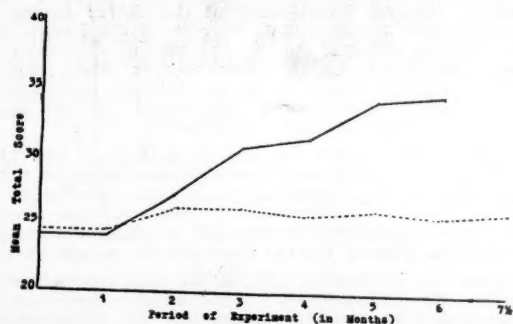


FIGURE I.

Changes between and within groups (Gardner Behaviour Chart): males. Plain line, experimental group; interrupted line, control group.

We can, then, state with confidence that the changes which occurred in the male resocialization group represent a response to a changed set of circumstances and activities, and cannot be attributed to chance factors or to the benefit accruing from routine ward management.

The same cannot be said for the females. Even when we take into account the fact that the initial status of the patients in the experimental group was lower than the initial status of patients in the control group, the mean gains in each group at the end of the period were not significantly different. Patients who participated in the resocialization programme failed to show significantly more improvement than did the controls, irrespective of whether the latter had yet received physical treatment or not.

Analysis of the changes within groups produced some interesting findings. Within the male experimental group, there was significant improvement after three months (1% level of confidence). Thereafter, as is apparent from Figure I, patients in this group continued to improve. At six months, comparison with the initial ratings yielded differences which were significant beyond the 0.1% level of confidence.

There were two periods in which significant changes occurred in the status of patients in the male control group—the second and third months. The level of improvement was not maintained, and the course of physical treatment which followed the six months' experimental period failed to effect any significant improvement in their condition.

In the female experimental group, significant improvement occurred in the first, second and final months only. There were no significant changes, at any stage, in the status of patients in the female control group.

Analysis of the individual items which contributed to the changes that occurred within the four groups studied clarifies the picture very considerably. It became apparent that only in the male experimental group did the changes which took place have any real psychological and clinical significance.

The items which contributed most to the improvements seen in the male experimental group were attention to personal appearance, sociability, self-entertainment, work

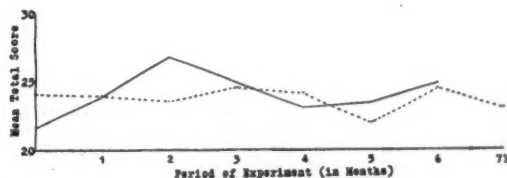


FIGURE II.

Changes between and within groups (Gardner Behaviour Chart): females. Plain line, experimental group; interrupted line, control group.

capacity, work initiative when alone and when closely supervised, and willingness to follow directions. It is of interest that these were the seven items on which, prior to the implementation of the resocialization programme, the group gained its lowest ratings. Items which were largely unaffected were sleep (except during one period, and this will be discussed), appetite, the various types of control (activity, noise disturbance, temper and combativeness), care of property and cooperation in routine. On all of these, patients in this group were already scoring relatively well prior to the introduction of the resocialization programme. One is tempted to speculate that there may be a limit to the amount which can be achieved with patients such as these, and that this limit had already been reached in some areas prior to the introduction of the resocialization programme.

In the male control group, the items which were substantially affected were attention to personal appearance and sleep, and these during the second and third months only. We can offer no explanation for the improvement in attention to personal appearance. Comparison with the ratings on sleep in the experimental group over this period does, however, afford an explanation for the latter. The experimental group showed substantial improvement over this period too, and in this period only. It would seem as if sleep in the ward was affected by some environmental circumstances which had little relation to the experiment, and which benefited both groups equally.

In the female experimental group, the only items which were substantially affected were attention to personal appearance and care of property. It is not clear how far improvements in personal appearance depended on the patients' own efforts rather than on the increased intervention of the nurses.

In the female control group, no one item or series of items showed any substantial gain or loss over the period studied.

Scale II.

The findings on Scale II were in substantial agreement with those on the Gardner Behaviour Chart. The male experimental group was the only one which showed evidence of any real changes, and here the items principally affected were reality testing, communication, manifest overt behaviour and intellectual functioning. Resocialization in the female experimental group, and routine ward management and physical treatment in the control groups, all failed to produce significant improvements.

Staff Comments.

It remains to consider very briefly the staff comments on patients.

The nursing staff in both the parent and experimental wards reported very considerable progress in the male patients who participated in the resocialization programme. All patients were considered improved, although in some the improvements were small. In particular, the staff commented on the patients' increased interest and initiative, and their decreased restlessness and resistiveness. Patients who were previously mute or rarely spoke became more communicative; patients were generally more friendly towards the staff and more sociable towards each other. There was a marked reduction in incontinence of urine and faeces.

There was considerable difference in opinion among the staff in the parent and experimental wards concerning the female patients who participated in the resocialization programme. The staff in the parent ward noted very little improvement; in the experimental ward, the staff felt that a number of intangible but nevertheless important changes had occurred, more particularly in the patients' general demeanour. They reported that patients were less rigid in their posture, more alert in appearance and more receptive to a friendly approach—in the words of the nurse in charge, "more human".

Discussion.

The experimental design of any study of human behaviour patterns presents great difficulties. Variables are numerous, tending to fluctuate in importance during the experimental period; new variables may emerge; environmental and endopsychic factors are closely interwoven. Their separate assessment is often impossible, and deductions from findings, even after careful scrutiny, are at times erroneous.

The study of behaviour changes in 40 psychotic patients, deeply embedded in the mosaic of a long-stay mental hospital, exposed to and at the same time moulding their environment, emphasizes these difficulties.

A four-channel approach—the ultimate assessment being made from observations by the nursing staff of the parent ward and of the experimental ward, by the psychologist and by the psychiatrist—was used to ensure, as much as possible, the validity of findings.

It can be stated with confidence that intensive and prolonged resocialization can produce significant behaviour changes in withdrawn patients suffering from schizophrenia of long standing. The outstanding finding in this particular experiment, however, was the marked difference in response to the resocialization programme by males and by females.

What are the reasons for this puzzling discrepancy? We shall examine a few of the more likely hypotheses in the light of our own observations, and of the information which was directly available from the hospital files and the experiment itself.

1. There were basic differences in the composition of the male and female experimental groups. There is very little evidence to suggest that this was so. In all their major aspects (e.g., age, duration of illness, initial status in relation to all the various items of the Gardner Behaviour Chart and Scale II), the groups were fairly comparable. It is possible, of course, that there were other more subtle ways in which the two groups differed, and that these may be related to response to a programme of this kind.

2. Male psychotics are more responsive to an intensive resocialization programme than are female psychotics. There are no a-priori grounds for considering that this may be so. It may, however, provide a useful line of investigation for future research.

3. Improvement in the behaviour of patients is at times too subtle to permit its measurement on any psychiatric or behaviour scale. While there is some evidence that changes may have occurred in females in the experimental group which were too subtle to be adequately reflected on either of the scales employed in this study, we have shown that, in the male group, the response went far beyond subtle changes of this kind, to improvements which could be assessed quantitatively, were clearly indicated on both scales, and were corroborated by the written comments of the staff in both the parent and the experimental wards.

4. Conditions in the male and female parent wards differed and, if they were more favourable on the male side, would tend to reinforce the effects of the resocialization programme. While the physical condition of the two parent wards was very similar, it is very possible indeed that this may have had some bearing on the problem. Careful interviewing of the charge nurses in the two wards revealed that, whereas on the female side the patients returned to the parent ward and were treated in very much the same way as other patients in the ward, the charge nurse in the male parent ward showed special attention and consideration towards those patients who attended the resocialization sessions.

5. There were differences in the pattern of activities set down for the male and female resocialization sessions. Since the detailed organization of the resocialization sessions was the responsibility of the nurse in charge, there were, inevitably, differences in the kind and variety of activities planned for the male and the female groups.

It was our observation that, in the male resocialization sessions, the emphasis was on individual rather than on group activities, and in particular, on those which required a maximum of individual effort. Patients were frequently seen playing tennis and billiards, sometimes with the nurses and not infrequently with each other. In the female resocialization sessions, the time was spent in simple ball games (with no competitive element), in dancing with each other or with members of the nursing staff, and in reading, knitting or similar relatively "passive" activities.

The staff in the female ward commented on a "renewal of interest" among their patients when joint sessions with the male resocialization group were introduced. This would suggest that, for the females at least, interest in the sessions had already begun to flag, and that a further impetus was needed which the male staff and patients in some way supplied. The response among the female patients to the joint sessions was reflected in a higher rating on the Gardner Behaviour Chart.

6. There were basic differences in approach by the nursing staff involved in the male and female resocialization sessions. Our observations would strongly support this hypothesis. The members of the staff in the male experimental ward were far more sensitive to the varying and growing needs of patients, and the programme was more closely adapted to those needs as they arose. The therapeutic climate appeared far better; the leadership shown by the charge nurse was unobtrusive, yet ever present. In the female experimental ward, the staff members were more rigid in their approach to the problem, the programme appeared more stereotyped,

and leadership was somewhat overpowering for the degree of regression existing in the patients.

The overall impression gained from this experiment is in favour of a resocialization programme as the treatment of choice in dealing with patients with long-standing psychoses. There is little doubt that, as a method of treatment, it is more successful for the deteriorated patient with long-standing schizophrenia than is, for example, physical therapy. It is also true, however, that a programme of this kind is unlikely to produce a maximum response unless: (i) the staff members who undertake to organize and direct the sessions are enthusiastic, and are capable of maintaining that enthusiasm in the face of slow and fluctuating improvement, and have sufficient insight to understand the growing needs of the patients under their charge and to adapt the programme to meet those needs; (ii) the environment in the parent ward is such as to reinforce the gains made at the resocialization sessions.

In this experiment, the environmental setting was far from ideal. Overcrowding of the hospital would not permit permanent transfer of the experimental group to an attractive ward which would offer all facilities for resocialization. In all, only 16 to 22 hours per week were spent in a therapeutic climate; the remaining hours were spent in the parent ward, where sleeping and eating arrangements were, to say the least, unstimulating, and the environment provided for leisure hours was drab and unattractive.

There remains the question of the practical economics of a resocialization programme. The staff-patient ratio of 1:3, as existed in this study, is not usually found in mental hospitals for long-term patients. It certainly strained the nursing resources of this hospital to a considerable degree. The staff involved, although cooperating enthusiastically, nevertheless complained of the severe strain which the experiment generated during therapeutic sessions. To quote one staff member: "We get these patients going again with our own guts."

On the other hand, it must not be forgotten that permanently withdrawn, vegetating psychotic patients present a tremendous strain to any hospital administration. They absorb energy which could be better spent elsewhere, and every procedure which may change them into useful members of the hospital community appears worth undertaking.

Summary.

Forty schizophrenic patients of long standing, from the "back wards" of the Kew Mental Hospital, were selected for study. Twenty of these, acting as controls, remained in their wards and carried on as usual; the remaining 20 (matched with the controls), while continuing to live in the parent wards, were transferred to attractive open wards of the hospital for eight to 11 two-hourly sessions per week over a period of six months. The control and experimental groups each contained 10 males and 10 females. During the first three months, separate sessions were arranged for males and females; later, there were some joint sessions. The actual planning of the content of sessions was left to the nurse in charge, and typically included billiards, table tennis, simple ball games, etc., and in the joint sessions, mixed dancing and similar activities.

At the end of the experimental period, the control groups were given a six weeks' course of physical treatment (E.C.T. and chlorpromazine).

We were able to demonstrate that a resocialization programme of this kind can produce improvements among long-term schizophrenic patients which are significantly superior to those which can be obtained through routine ward management or physical therapy. However, the discrepancy between the responses obtained in the male and female resocialization groups demonstrated the need for careful selection of staff and for detailed planning of the programme if a maximum response is to be achieved.

Acknowledgements.

We wish to express our thanks to the Mental Hygiene Authority of Victoria for permission to publish this

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A RELAXING MACHINE.

By F. W. KNOWLES,
 Wyndham, Western Australia.

WHEN our first baby was born in New Guinea, my wife and I soon found that a great deal of crying occurred without any cause that we could trace. I believe many parents experience this difficulty, though there are occasional babies who are so placid and contented that



FIGURE I.

String bag used for carrying infants in New Guinea.

crying is rare. As native women out there silence their own crying infants by carrying them in a string bag (Figure I) and walking about till the baby is asleep, we obtained such a bag and found it fairly effective.

Experiments indicated that the potent factor in this native method of baby hypnosis was the rhythmic up-and-down movement, which is imparted to the baby with each step. A canvas hand-carrier (Figure II) was used for these experiments, and with it the effect of several forms of motion and oscillation could be tested readily. Perpen-

dicular reciprocation was found to be much more powerfully hypnotic than other forms of motion, such as swinging or rocking after the manner of old-fashioned cradles and rocking-chairs. By suspending the hand-carrier from a ceiling hook by a spring, an oscillatory system is established, by means of which perpendicular reciprocation can be maintained with little effort by hand, or automatically with a small electric drive unit.

When confronted with crying infants in my practice, I have often shown parents that an angry, screaming baby can be silenced in about two seconds by such motion, albeit with very considerable physical exertion if no special equipment is available. Only rarely have I failed to silence a crying baby in this way, and in those cases of failure it may be that an increased amplitude of reciprocation would have overcome the difficulty. Some parents are astonished when their doctor carries out such an unconventional demonstration, and I have often felt obliged to limit the amplitude of motion to avoid alarming the parents whilst soothing the infant.

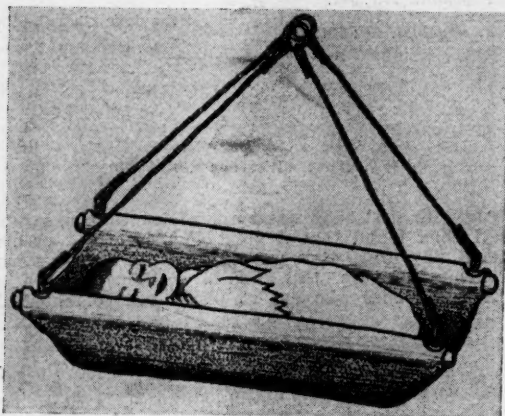


FIGURE II.
Canvas hand carrier used in experiments.

The most effective frequency of oscillation for infants less than a year old was found to be about 90 per minute, and an amplitude of four inches was usually sufficient to stop crying at once and produce somnolence in a few minutes.

Impressed with this physical method of hypnosis, I constructed a machine (Figure III) capable of subjecting adults also to perpendicular reciprocation. To oscillate an adult with an amplitude of four or more inches at a rate of 90 per minute would require very massive machinery indeed, with solid foundations. For maximum effect on adults, a lower frequency and much greater amplitude might even be desirable; I have not yet constructed equipment to explore this possibility.

The present machine was designed for oscillation at frequencies of 120 to 180 per minute, and amplitudes of three quarters to one and a half inches, to be capable of operation in an ordinary building without floor reinforcements. This represents a compromise which, judging by its effects on infants, has slightly inferior hypnotic power, but avoids an expensive, cumbersome machine.

A heavy, rigid wood frame is supported on four springs, and carries a firm top board on which a mattress and pillow are placed to accommodate the patient (Figure III). A steel mass weighing 13 lb. is suspended from the frame by a rod, to which perpendicular reciprocating motion of one-inch amplitude can be imparted by a crankshaft. The latter is driven at 120 to 180 revolutions per minute by an induction motor of one quarter of a horsepower, through a variable-speed-reducing gear, the control knob of which can be seen on the side of the frame. A diagrammatic

sectional view of the frame, showing the power-drive mechanism, is shown in Figure IV.

The machine provides an oscillatory system, the natural frequency of which varies to an extent inversely with the weight of the patient carried. When the motor is switched on, the control knob should be turned until the point of maximum oscillation is found. At this point, the frequency of reciprocation of the steel mass is equal to the natural frequency of the system. By turning the control knob a little away from this point of resonance, the amplitude may be reduced as desired, if found excessive. Effects obtained with the machine can be summarized as follows.



FIGURE III.
Relaxing machine for adults.

It will nearly always quickly silence crying, and induce sleep in infants less than one year of age, whether they are distressed by known physical causes (e.g., thirst or otitis media), or otherwise. Its hypnotic power becomes less reliable in older infants and children, whilst in adults its effect is to produce a state of marked muscular relaxation. It appears that machine-induced relaxation

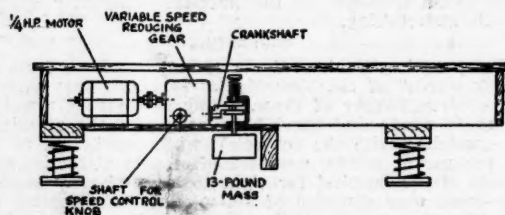


FIGURE IV.
Diagrammatic sectional view of the frame.

compels to somnolence and sleep in young infants, whilst in adults it produces little more than a pleasant, placid state of mind (i.e., with the present equipment). It is not impossible that a machine operating at lower frequencies and greatly increased amplitudes may compel adults to sleep also.

Sleep can occur in a tired adult while the machine is in oscillation, but may, of course, occur with equal facility without such motion. In such circumstances, assessment is difficult, but I have the impression that a period of about 20 minutes of machine-induced relaxation encourages the rapid onset of sleep in adults after the motor is switched off.

For difficult babies who disturb the peace of the home with excessive crying, I have found such a machine a reliable silencer. It may be used to carry a baby in a basket, or even several babies in a battery of baskets. Doubtless this method of infant hypnosis would have some

dangers if used carelessly, e.g., to silence the baby whose cry is a call for relief from physical trouble, if only from the irritation of a soiled napkin. It needs judicious use, therefore, and to obviate the last-named danger I have used it in conjunction with a sanitary bed (Knowles, 1957).

For adults, this machine should be useful in the treatment of those clinical states in which tension is a factor, and it may replace persuasive and suggestive methods of inducing relaxation, which often require much more time than a busy doctor can devote to each patient.

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Reviews.

Obstetrical Practice. By Alfred C. Beck, M.D., and Alexander H. Rosenthal, M.D. Seventh Edition; 1958. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 10" x 6 1/2", pp. 1120, with 952 illustrations. Price: £7 14s.

From time to time one reads a textbook and enjoys it because its contents are clearly and ably presented. Such a book is "Obstetrical Practice" by Beck and Rosenthal, now in its seventh edition. Probably its most attractive feature is the large number of carefully prepared drawings, which serve to illustrate the mechanisms of labour, both normal and abnormal, and many points of diagnosis and management.

In this latest edition, the section on placental physiology has been rewritten in the light of modern observations, the chapter on multiple pregnancy has been reviewed extensively, and recent work on hydramnios and cord complications is included. Reference to Credé's procedure in management of the third stage of labour has been deleted, and the Brandt-Andrews technique of placental expression is described and recommended.

Many will find the section on toxæmias of pregnancy unusually brief, as it is the authors' policy to omit confusing discussion; but the essentials are present. Other variations from usual practice include the routine intravenous administration of glucose (5%) in distilled water in labour, to avoid aspiration complications and to provide a ready vehicle for medication, for oxytocics and for restorative measures should they be necessary.

Each chapter has a very useful list of references, and where the text appears brief, the interested reader has not far to look for further study. This book is said to present the essentials of obstetrics to undergraduates and young practitioners; but there is much to appeal to the post-graduate and, indeed, to those who struggle to explain the obstetric art to their students.

Progress in Psittacosis Research and Control. Edited by F. R. Beaudette, with a foreword by Richard E. Shope; 1958. New Brunswick, New Jersey: Rutgers University Press. 9 1/2" x 6", pp. 286, with many illustrations. Price not stated.

AGENTS morphologically and serologically related to psittacosis virus are now known to infect a very wide range of birds, and also many mammals. Their medical importance arises from the fact that some of these agents can infect man, causing a disease which may be very severe. Biologically, the agents of the psittacosis group are of considerable interest in that they so often cause latent infection. In addition, there is currently some controversy as to whether they should be regarded as viruses or whether they are more closely related to the rickettsias.

The present volume is a record of the proceedings of a symposium held in New York in 1956. It is concerned primarily with the public health aspects of psittacosis as they appear to authorities in the U.S.A., where the human disease is associated with infected pet birds and, more recently, with infected poultry, especially turkeys.

The book is divided into four parts. The first three papers of Part I, "Ecologic Factors in Disease", by Dubos, Huebner, and Shope, provide a general background on latent infection and the factors which may precipitate the occurrence of disease in latently infected individuals. These are followed by essays on the epidemiology of psittacosis and a brief review of infections of mammals caused by infectious agents related to psittacosis.

Part II is concerned with psittacosis diagnosis, and contains chapters on the isolation of the agent, serological and intradermal tests, the pathological lesions found in turkeys, and the diagnosis of the human infection.

Part III is concerned with therapy of the disease in infected birds, in which chlortetracycline has completely altered the approach of veterinarians, and the final chapter summarizes the public health regulations framed to control the disease in the U.S.A. An epilogue written by Pollard covers relevant papers written since the symposium.

The volume is beautifully produced and well indexed. It provides a useful summary of diagnostic and public health information on psittacosis in the country where measures for the control and investigation of that disease have been advanced to the greatest degree.

Orthopaedics in General Practice: Is it Rheumatism, Doctor?

By W. H. Gervis, M.A., M.B., B.Ch., F.R.C.S.: 1958. London: William Heinemann (Medical Books), Limited. 7 1/2" x 4 1/2", pp. 130, with 32 illustrations. Price: 10s. 6d. (English).

THE author of this book has succeeded in producing a primer of general practice orthopaedics which is both readable and easily understood. Line drawings illustrate the text admirably, and apart from a misspelling of spondylosa on page 42, the production is good. The sections are four in number—upper extremity, back, foot and minor injuries. These are clear and concise.

The explanation of the pathology of tennis elbow is not acceptable, and the worthwhile treatment by cortisone injection is not mentioned. Rightly so, such commonly missed conditions as De Quervain's disease, trigger finger and extensor tenosynovitis are well described. Particularly praiseworthy is the author's mention of interscapular pain in cervical spondylosis.

The cure for many ills afflicting the back is to "stretch like the animals do". This would hardly satisfy the sufferers from "discogenic sciatica". To stretch as described is the message in the section on the back. The principle of correct posture is certainly important, but not a cure-all. It must surely be rare to need a plaster jacket for osteochondritis in a young person.

It is regretted that the surgery of ingrown toenail is limited to wedge resection. The most satisfactory procedure is resection of the basal half of the toenail bed.

Arthrodesis of the first metatarsal-cuneiform joint for hallux valgus is certainly not worthy of mention in a book of this nature.

In conclusion, it may be stated that this small book is worthy of attention by the general practitioner and by final-year students. The author is to be commended on the clarity of production.

Practical Blood Transfusion. By J. D. James, M.R.C.S., L.R.C.P., with a foreword by P. L. Mollison, M.D., F.R.C.P.: 1958. Oxford: Blackwell Scientific Publications. 9" x 5 1/2", pp. 192, with seven illustrations. Price: 20s. (English).

THIS book is a concise and generally reliable account of all phases of blood transfusion. The first three chapters deal with various aspects of the organization of blood transfusion services in blood banks and hospitals. This section is very sound. The author rightly stresses the importance of strict rules and good discipline in the control of blood transfusions in hospitals, and a model set of rules is given on which hospitals can base their own regulations.

The chapter on laboratory methods is one of the best in the book. Its helpfulness is increased considerably by the inclusion of a glossary of terms used in blood-group serology, a subject notorious for its complex terminology. However, one or two of the definitions are not adequate. A wide range of techniques is given, and the steps of each technique are set out in numerical order with precise instructions for their performance. One would have liked to see, among the methods of Rh testing given, some mention of the simple, reliable and widely applicable technique of incubating test slides in a moist Petri dish or other suitable container.

The question of how much detail to include in a book of this nature is always a vexed one, but in one or two places in the clinical sections a little more detail would have been desirable. Thus, in the discussion of such an important complication as circulatory overloading, fuller details of the clinical features of this condition would have increased its practical value. Some of the details given of transfusion techniques are not

applicable to the apparatus used in Australia, and many transfusionists would disagree with some of the recommendations as to choice of vein and technique.

The author concludes with an interesting discussion of some of the legal aspects of blood transfusion. On the whole, the book can be recommended with confidence to medical practitioners.

Psychopathic Personalities. By Professor Kurt Schneider; translated by M. W. Hamilton, B.A.; foreword by E. W. Anderson, M.D., M.Sc., F.R.C.P., D.P.M.; 1958. London: Cassell and Company, Limited. 7" x 4½", pp. 178. Price: 18s. (English).

THE term "psychopathic" is such a loose one that a study of the true nature of psychopathy does not feature prominently in psychiatric discussions, simply because an attempt at the study of genesis, classification and treatment is prone to end in frustration and vagueness. Further, the term "psychopath" is most frequently reserved for the social failure, the delinquent or the criminal.

Kurt Schneider published his "Psychopathic Personalities" first in 1923. This has recently been translated into English by M. W. Hamilton, B.A., of the Department of Psychiatry, University of Manchester, and the translator has done a good job.

Schneider's approach clears the air in several aspects of the problem. He presents a reasonably cohesive and intelligible classification on the basis of good descriptive psychiatry. He makes no attempt to deal with genesis or treatment in the volume.

Schneider first defines an abnormal personality, stating it to be mainly an excess or deficiency of certain personal qualities, good or bad, in relation to an accepted yet broadly conceived range of average personality. In these terms the saint and the poet, he states, are equally as abnormal as the criminal. Schneider's definition of psychopathy is clinical and not moral. Perhaps his most important submission is that the term "psychopathy" denotes a category of abnormal personality and not a form of mental illness. He examines the available evidence, and concludes that there is no correlation between psychopathy and constitution, physiological abnormality or genetic difference. A large section of this small book is taken up with meticulous summaries of the attempts of other Continental psychiatrists to arrive at a reasonable classification. This evaluation, however necessary it may seem in the interests of completeness, is a little tedious to a reader who is most anxious to know what Schneider alone thinks, rather than what a host of other writers think. We doubt whether the bibliography of more than ten pages would be referred to except by a student as meticulous as Kurt Schneider.

The second half of the book is very welcome. Here are to be found the author's ideas on classification. In 75 pages he classifies psychopaths as "hyperthymic", "depressive", "insecure", "fanatic", "explosive", "weak-willed" and "asthenic". Whilst he pays due attention to variants, the word is never obscured by the leaves.

Schneider defines a characteristic anomaly of personality which runs consistently through each of his types, so that, despite a very full description of each, his classification swings intelligibly round a few basic points of reference.

This is a book for a psychiatrist, social worker or medico-legal expert who would like to know in his own mind what he is talking about when he describes an individual as a "psychopath". The book is sensibly priced.

Clinical Endocrinology. By Karl E. Paschke, M.D., Abraham E. Rakoff, M.D., and Abraham Cantarow, M.D.; 1958. Second Edition. New York: A. Hoeber-Harper book. 9½" x 5½", pp. 948, with 199 illustrations and 48 tables. Price: \$18.00.

THE names of Paschke, Rakoff and Cantarow are familiar as a team in numerous papers, as well as in the first edition of the present book. "Clinical Endocrinology" deals with the subject fully, and the relative space devoted to individual chapters is strictly in accordance with the size of the book as a whole. In this way the authors provide a well-balanced publication, and have included a chapter on diabetes which is valuable in view of the increasing complexity of the known relationships between the pancreas and other endocrine glands. Comparison with the first edition of this book provides an interesting index of the expansion of knowledge which has taken place in this dynamic field in a period of four

years. The physiology of the placenta now deserves a chapter in such a book, and a section dealing with laboratory procedures has enhanced its value.

The descriptions of diseases are preceded in each chapter by an account of the appropriate physiology, and the diseases are seen in relation to the normal function of the various glands.

One of the most pleasing features of the book is that the text is never allowed to degenerate into a mass of confusing or contradictory experimental findings. In keeping with the general style of the book, references are relatively few but to the point; this enables those who are anxious to read a special topic in detail to obtain a foothold in the relevant literature, and at the same time avoids the usual depressing maze of references which seems designed merely to impress. A book of 900 pages will inevitably become a reference book to all but a select band of enthusiasts, but its individual chapters form excellent starting points for excursions into more rarified reading.

It is difficult to offer a serious criticism of such an excellent book; but it is perhaps fair to say that the style is austere and in places unattractive—which, however, is almost inevitable in a book containing so much purely factual material. Illustrations are adequate and for the most part effective without being redundant, while views regarding treatment are orthodox, and are neither too conservative on the one hand nor too radical on the other.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Perspectives in Virology: Twenty Specialists Report on Recent Progress in Various Fields of Virological Research", edited by Morris Pollard; 1959. New York: John Wiley & Sons, Inc. 9" x 5½", pp. 324, with illustrations. Price: \$7.00.

The title is self-explanatory.

"Hospital Laboratory Services, Second Report of the Expert Committee on Health Laboratory Methods", World Health Organization Technical Report Series, No. 161; 1959. Geneva: World Health Organization. 9½" x 6½", pp. 32. Price: 1s. 9d.

The report from a meeting held in October-November, 1958.

"Pain", by Harold G. Wolff, M.D. and Stewart Wolf, M.D.; Second edition; 1959. Oxford: Blackwell Scientific Publications. 8½" x 5½", pp. 134, with 20 illustrations. Price: 32s. 6d. (Abroad).

This volume offers "a brief synthesis of the current thinking on pain in the perspective of some of the important past developments".

"Ataractic and Hallucinogenic Drugs in Psychiatry: Report of a Study Group", World Health Organization Technical Report Series, No. 152; 1958. Geneva: World Health Organization. 9½" x 6½", pp. 72. Price: 3s. 6d.

The report from a meeting held in November, 1957.

"Expert Committee on Addiction-Producing Drugs, Ninth Report", World Health Organization Technical Report Series, No. 160; 1959. Geneva: World Health Organization. 9½" x 6½", pp. 16. Price: 1s. 9d.

The report from a meeting held in October, 1958.

"Post-Graduate Training in the Public Health Aspects of Nuclear Energy: Fourth Report of the Expert Committee on Professional and Technical Education of Medical and Auxiliary Personnel", World Health Organization Technical Report Series, 1954; 1958. Geneva: World Health Organization. 9½" x 6½", pp. 56. Price: 3s. 6d.

The report from a meeting held in September, 1957.

"Symposium Sul Nuovi Farmaci Antitubercolari", Milano, 16-17 Novembre 1958. Redattori degli Atti del Symposium: M. Corda, W. Montorsi. Milan: Stamperia Cesare Tamburini. 9½" x 6½", pp. 688, with many illustrations. Price: not stated.

The record of a symposium on the modern treatment of tuberculosis held in Milan in November, 1958. The volume is entirely in Italian.

The Medical Journal of Australia

SATURDAY, JULY 4, 1959.

PROGRESS IN THE WORK OF WHO.

THE World Health Organization now has 85 member States and three associate members, comprising countries in all five continents and on both sides of the Iron Curtain. It celebrated its tenth birthday last year, and the record of its first ten years' activity indicated that among world organizations of the intergovernmental type probably none had more convincingly justified its existence. The annual report of the Director-General, Dr. M. G. Candau, to the World Health Assembly and to the United Nations, concerning the work of WHO in 1958,¹ may well be said to confirm this assessment. Within WHO itself the year 1958 provided, in the Director-General's words, the first opportunity to submit to extensive and critical study the methods and means by which the organization has, in its first decade, contributed to the realization of the fundamental aim it is pursuing—namely, the attainment by all peoples of the highest possible level of health.

The record is unquestionably impressive, but the Director-General does not hesitate to place his finger on the weak spots. His report is in four parts; the first is a general review, the second a review of the six regions, the third a record of cooperation with other organizations, the fourth a long project list. Perhaps the most striking feature in the WHO programme is the concept of eradication, which is being applied vigorously to malaria, yaws and leprosy, and is being considered for smallpox. Real progress has been made in these projects, even if the end is not clearly in sight. However, it is less dramatic although sometimes overwhelming tasks that the resources of WHO have been more extensively occupied as the fundamental aim of the organization is pursued. Evidence of the international cooperation which WHO provides in its relations with national governments may be seen from the list of "projects in operation in 1958", which occupies 246 pages with an average of perhaps six to a page. For each project a statement is made on the aim, a brief account is given of the assistance provided by WHO and the work done, and, where possible, some assessment is made of the results.

In referring to the reports of the regional directors, the Director-General points out that, while the remarkable advances in health which started ten years ago continue, many of the original handicaps remain unchanged.

Administrative delays still interfere with the execution of important projects. The shortage of trained and even semi-trained personnel is very acute, and in many places downright critical. Priority still goes to the building of hospitals, laboratories and health centres rather than to the education and training of people needed to staff them. In many places the state of environmental sanitation remains unsatisfactory. Much still has to be done to develop national health statistical services and to train expert medical workers in this field. Dr. Candau states that if in many cases it can be argued that financial considerations make it difficult for governments to devote more to even indispensable health work, it remains true that, to a very considerable extent, failure to advance is a responsibility which WHO must share with the governments concerned. He adds: "It is therefore with this knowledge of tasks still to be fulfilled that we must assess any progress made in 1958 as well as in preceding years." Beyond any doubt a great deal has been done. In Africa the list is long: the fellowship programme has been greatly extended, especially in fellowships relating to the organization of public health services; the position in relation to maternal and child health and nutrition is hopeful; outstanding progress has been made in the fight against leprosy, which may yet disappear altogether, and similar hope exists for the eradication of malaria and yaws; and constructive steps have also been taken towards solving mental problems. In the Americas the decentralization process, an important aspect of WHO policy, has been completed by the opening of a zone office in Caracas, the eradication policy has been pursued to encouraging effect in relation to malaria and yaws (in Haiti), the yellow fever problem is being attacked, and smallpox is well under control. In the eastern Mediterranean region preliminary steps have been taken towards the elimination of smallpox, a bilharziasis control project is proceeding in Iraq, there has been significant progress in education and training both for undergraduates and for auxiliary health personnel, and the number of inter-country projects has increased. In the European region the position is in some ways different, and the main activity has taken the form of inter-country programmes of seminars, study groups and training courses, especially in relation to chronic and degenerative diseases and to virus diseases; attention has also been given to training in radiation protection and to the care of premature infants and the rehabilitation of handicapped children, and a combined approach has been made to trachoma and other communicable diseases. In South-East Asia rural health projects have progressed in India and Afghanistan and are being planned for Indonesia and Thailand, maternal and child health has received much attention, malaria eradication is being pursued, interest in environmental sanitation is slowly gaining ground, assistance has been provided for medical schools and other training institutions, and further efforts have been made to improve the collection of statistics on morbidity and mortality. In the western Pacific there has been a shift from individual or isolated demonstration projects towards the integration of such projects and towards coordinated public health services, but these and other advances are hampered by shortage of trained medical and auxiliary staff, a difficult problem which is occasioning much thought. After summarizing the work in the various regions Dr. Candau makes special mention of three major

¹ "The Work of WHO 1958: Annual Report of the Director-General to the World Health Assembly and to the United Nations", Official Records of the World Health Organization, No. 90; March, 1959. Geneva: World Health Organization. 11" x 9", pp. 262, with illustrations. Price: 10s. (English).

aspects of the WHO programme, improvement of environmental sanitation, malaria eradication and research, in all of which worthwhile progress has been made.

In referring to the tributes paid to the first ten years' work of WHO at the two days' commemorative session of the World Health Assembly last year, Dr. Candau records that these expressions of satisfaction provided great encouragement and powerful stimulus to the staff, especially to the hundreds of workers who are tackling difficult and complex problems in the field. They also indicate that two of the basic conditions for the success of WHO's future are being fulfilled—namely, the closest possible cooperation between governments and WHO, and the realization by governments that in WHO they now have adequate means through which international cooperation in the field of health can be applied to their own health needs and problems. However, Dr. Candau comments, for all those responsible for guiding WHO in its second decade the tributes have another and important meaning: rather than remain satisfied with what has already been accomplished, they must now concentrate on the many problems which are still unsolved and which call for the mobilization of all the resources that can be mustered on the international level. We have no hesitation in saying that, as it tackles its bold and constructive programme and seeks to mobilize all available resources, WHO may be sure of the goodwill and support of the practising medical profession, which, while it may be cautious in the attitude it adopts to governmental organizations, recognizes a good job when it is being done.

Current Comment.

ANDROGENS DURING PREGNANCY.

It is probably fair to say that thirty years ago most of the drugs in use had little effect on the course of disease, but on the other hand they were relatively free from hidden danger. Today we have at our disposal a host of potent and highly specific agents, the use of which is liberally beset with traps for the unwary. Iatrogenic disease, arising from the ill-timed use of such drugs, has become a much more serious problem in recent years, and it is our duty to keep ourselves well informed of these possible dangers. In a recent issue we drew attention to the danger associated with the use of steroid-containing eye drops.¹ A danger of another sort has been described in several recent publications, namely, that of giving androgens to women during pregnancy. Two papers on this subject may be mentioned. One, by G. Nellhaus,² describes a case in which an expectant mother was given 10 mg. of methyltestosterone twice daily for 100 days from the third week of pregnancy, on account of recurrent abortions. Therapy was discontinued because of the deepening effect on the mother's voice. At term a healthy baby was delivered, and the parents were informed that they had a son with cryptorchidism and hypospadias. The infant was referred to a consultant, who discovered that she was in fact a female pseudohermaphrodite with fused labia, an enlarged clitoris, and a vagina opening into a urogenital sinus. The diagnosis was confirmed by laparotomy.

The second paper, by J. A. Black and J. F. R. Bentley,³ describes a case in which the mother was given methyl-

testosterone "in error", in a dosage of 5 mg. twice daily for 12 weeks between the second and fifth months of pregnancy. When treatment was stopped the mother's voice had become deeper. A healthy female infant was born two weeks after term; the clitoris was moderately enlarged and the labia minora were partially fused, with elimination of the fourchette. In this case the deviation from normal was very much less than in Nellhaus's case, and the enlargement of the clitoris regressed with time, so that at the age of 20 months it was almost normal in size, though the prepuce was still larger than normal. Black and Bentley list seven other reported cases, including that of Nellhaus, in which androgenic treatment early in pregnancy had led to a greater or lesser degree of masculinization in a female fetus. That the condition is the result of the administration of androgens there can be little doubt, in view of the number of cases with closely similar histories, and of the fact that this phenomenon can be reproduced at will in experimental animals. The severity of the effect is to some extent related to the stage of pregnancy at which the administration of androgens was instituted. It is probable that if the taking of androgens is not begun until after the end of the third month of pregnancy, the only likely effect is some enlargement of the clitoris, and there is evidence that in these cases this enlargement tends to correct itself as normal growth progresses. On the other hand, such masculinization is not invariable when androgens are given to pregnant women, and one remarkable case is quoted in which the mother, under treatment for a carcinoma of the breast, received androgenic hormone throughout her pregnancy without any virilizing effect on herself or on her female child.

At the end of their paper Black and Bentley refer to some papers in which virilizing effects have been reported after the use of progesterone or ethisterone during pregnancy; it is suggested that in these cases the virilizing effect may depend upon abnormal metabolic disposal of the hormone by the mother. However, it seems clear that the administration of hormones during pregnancy is a matter to be approached with caution, and there is probably very rarely any justification for the use of those with which the risk of masculinization is greatest.

THE PREVENTION OF POLIOMYELITIS.

DEVELOPMENTS in the field of the prevention of poliomyelitis have proceeded apace in recent years, so that the report¹ of the Expert Committee on Poliomyelitis of the World Health Organization which met in Geneva in 1957 may seem to be running late. However, there is a great deal that is of current interest in the report, which is the second report of the Expert Committee. A review of the poliomyelitis situation over the previous three years suggests a change of pattern in the incidence of the disease. Several countries which had previously suffered little from the disease reported an increased number of cases; others reported a notable reduction, which in most cases, but not in all, was attributed to mass immunization with Salk vaccine or with other vaccines of the inactivated type. The value of such vaccines is, of course, still disputed, but the report reviews accumulating evidence to show that the use of such vaccines has had a considerable effect in reducing the incidence of paralysis. At the same time, it has been noted in the United States and in South Africa that vaccination did not apparently shorten the course of an epidemic, and studies have revealed that it neither prevented infection nor interfered with the dissemination of the virus in the face of an epidemic.

The report also deals with the preparation and testing of vaccines, the design of vaccination programmes, immunity surveys, the WHO poliomyelitis programme,

¹ *MED. J. AUST.*, 1959, 1: 503 (April 11).

² *New Engl. J. Med.*, 1958, 258: 935 (May 8).

³ *Lancet*, 1959, 1: 21 (January 3).

¹ "Expert Committee on Poliomyelitis: Second Report", World Health Organization Technical Report Series, No. 145; 1958. Geneva: World Health Organization. 9 1/2" x 6 1/2", pp. 84. Price: 3s. 6d. (English).

live virus vaccines and the problems raised by enteric viruses. It emphasizes the importance of determining the relative priority of the various age groups in deciding a vaccination programme. It states that, in general, first priority should be given to those in age groups showing the highest incidence. Exceptions may be made in some countries where there is a relatively high incidence of severe paralysis in young adults, and where it may seem of greater importance to protect this group than to give complete priority to age groups of children showing a somewhat higher incidence. Young adults exposed to special risks, such as pregnant women, doctors, nurses and other hospital and laboratory personnel, may also be placed in a higher priority group.

In reviewing the results of immunity surveys the report recognizes that these are useful or even essential under certain circumstances, but generally are regarded as a poor substitute for proper reporting of paralytic cases. It is recommended that the WHO poliomyelitis programme based on the designation of WHO regional laboratories should be extended to enlist the cooperation of national laboratories, the regional laboratories maintaining their functions as reference laboratories. The report expresses great hopes of the potential value of live attenuated virus vaccines, trials of which are still going on. In considering the problems raised by the numerous recently discovered enteric viruses, some of which are common causes of aseptic meningitis indistinguishable from non-paralytic poliomyelitis, the report recommends that in the reporting of poliomyelitis paralytic cases should be reported separately and that the term aseptic meningitis should be used in place of the term non-paralytic meningitis. The report stresses the fact that the object of trials of live virus vaccine and the need for carrying them out are based on the belief that they may further reduce the incidence of poliomyelitis. It is stated that should these trials of live attenuated poliomyelitis virus be successful, this will bring not only the hope that a more solid immunity against poliomyelitis will be achieved, but also the possibility of eliminating or reducing the movement of virulent poliomyelitis viruses within a given community—a result which the inactivated virus vaccine does not achieve.

TRIETHYLENE THIOPHOSPHORAMIDE.

It is more than a decade since nitrogen mustard became accepted as an important agent in the treatment of some forms of leukaemia and the reticuloses, and it has been followed by several improved versions which are less toxic and equally effective. Other unrelated chemicals with similar properties, such as busulphan and mercaptopurine, have also been developed. As a class, these substances have come to be known as cytotoxic, cystostatic or antimetabolic agents (their action is against cells undergoing mitosis), and they are sometimes referred to as chemotherapeutic agents,¹ though the fact that this term has hitherto been mainly employed for substances with a bacteriostatic or bactericidal action may lead to confusion. It is natural that some investigators should have been encouraged to try the effect of these substances on metastatic tumours of various descriptions, but so far this aspect of their use has been relatively little discussed in English-language journals, though much of the pioneer work in this field has been done in America. Some of the most encouraging results refer to triethylene thiophosphoramide, also known as thiotepa. The history of this substance has recently been reviewed by A. Ravina² (in French), and the following account is mainly derived from his article.

Thiotepa is closely related to the nitrogen mustards and to triethylene melamine, but is less toxic than either. It can be administered either by mouth or by intramuscular or intravenous injection. The first account of the clinical trial of thiotepa was by H. Shay and his colleagues³ in America, in a report on the preliminary results of its use in experimental and clinical leukaemia, but at the end of their account they mention having treated two patients with recurrent cancer of the breast, with "striking clinical and objective improvement". Since then, the value of thiotepa has been demonstrated in a number of trials. Jeanne Bateman and her colleagues were among the first to give it an extensive trial in the treatment of carcinoma of the breast, and their results are set out in a series of papers published in 1955 and 1956.⁴ Among more recent reports, T. Greco gives details of two series of patients with cancer of the breast. The first series⁵ consisted of 35 patients with recurrent cancer who were treated with thiotepa; of these, about two-thirds obtained some degree of relief. The second series⁶ comprised 36 patients treated by radical surgery and simultaneous chemotherapy, either thiotepa or triethylene melamine being used. All cases in the second series were in Stage II or III of Portmann's classification. These 36 patients were followed up for periods ranging from 13 to 40 months after treatment; one patient, whose cancer was advanced at the time of operation, died after 12 months, a second after 28 months; the remainder were all alive up to the time of the preparation of the report. Greco admits that it is premature to draw definite conclusions, but seems to have good reason for suggesting that the combination of surgical treatment with chemotherapy may prove a useful advance in treatment and is worthy of more extensive trial.

Thiotepa has been tried in the treatment of a variety of other cancers, in a few cases with remarkable success. J. L. Tullis⁷ has reported the results of treating with it 15 patients with disseminated malignant melanoma, some in a very advanced condition; a few of these patients obtained striking remissions, but Tullis remarks that it was not possible to predict which patients were likely to respond to treatment. However, Ravina regards cancer of the breast as being, at the moment, the principal indication for the use of thiotepa outside the reticuloses. Ravina concludes with the remark that triethylene thiophosphoramide has a relatively low toxicity and appears to be one of the most interesting of the cytostatic drugs at present available.

Since the appearance of Ravina's paper, an important report by G. W. Watson and R. L. Turner has been published⁸; these authors have introduced a new twist in the use of thiotepa by combining it with testosterone in the treatment of metastatic breast cancers. It is well known that hormone-dependent tumours sooner or later cease to respond to hormone administration, and it is commonly supposed that this is because of the selective multiplication of tumour cells which are hormone-resistant. In combining the use of thiotepa with testosterone Watson and Turner hoped by this two-pronged attack to prevent or delay the development of hormone resistance. They considered that testosterone might also be of value in counteracting to some extent the marrow-depressing action of thiotepa. In the event, they were apparently enabled to give much higher doses of thiotepa when this was combined with testosterone than when given alone, and their first results indicate that the combination was also clinically more effective. Watson and Turner propose a trial of surgery and chemotherapy as opposed to surgery and radiation, and their further reports will be watched with interest. It seems possible that in the future antimetabolic agents may play a much bigger role in the treatment and prevention of metastatic cancer than has hitherto been the case.

¹For opinions on the use of the term chemotherapy see *Med. J. Aust.*, 1953, 2: 687 (October 31), where the question is fully discussed. The use of the term in relation to malignant disease is in one sense particularly apt, since it refers to the use of chemical agents as opposed to irradiation.

²*Presse méd.*, 1959, 67: 633 (March 28).

³*A.M.A. Arch. intern. Med.*, 1953, 92: 628 (November).

⁴*J. Amer. med. Ass.*, 1956, 162: 701 (October 20).

⁵*Presse méd.*, 1959, 67: 131 (January 24).

⁶*Presse méd.*, 1959, 67: 247 (February 7).

⁷*J. Amer. med. Ass.*, 1958, 166: 37 (January 4).

⁸*Brit. med. J.*, 1959, 1: 1315 (May 23).

Abstracts from Medical Literature.

DERMATOLOGY.

Paronychia.

C. H. WHITTLE, J. L. MOFFAT AND R. A. DAVIS (*Brit. J. Derm.*, January, 1958) consider that they can distinguish two types of paronychia. These are: (i) Primary paronychia, which is characterized by an onset, which is often sudden, of swelling, redness, heat and tenderness involving one or more finger-nail folds; these tend to heal slowly but relapse is frequent. (ii) Secondary paronychia, in which the nail folds are thickened, obscuring the cuticle; there is no redness, and no sudden onset; the folds are merely participating in a low-grade chronic inflammatory condition of the skin of the finger, as in degreasing dermatitis, atopic eczema or psoriasis. In 24 cultures for fungi made in cases of secondary paronychia no *Candida albicans* was obtained. The authors review 104 cases of primary paronychia, 96 of the patients concerned being women, and 50% being between 40 and 60 years old. They state that *Candida albicans* was the predominating organism recovered in these cases. Lesions in the early acute stage showed that the characteristic pocket which forms between nail and fold follows, and does not precede, invasion by the organism. The right middle finger was the digit which was most frequently first affected. It is suggested that *Candida* is pathogenic and can invade the nail fold, but that its power to invade may depend on its change from the yeast to the mycelial phase. Experimental occlusion and maceration for three weeks of a healthy nail-fold gave rise to spontaneous active colonization of the keratin by *Candida*. In treatment, the most important measure is to protect the finger from rough and wet work. This may be achieved by avoidance, barrier creams or rubber gloves, preferably lined. The authors believe that since the nail changes are essentially secondary, it is quite unnecessary to treat the infected nail plates with abrasion and fungicides, *Candida* infection being in this respect quite different from *Trichophyton* infection.

Relaxin Therapy in Diffuse Progressive Scleroderma.

J. A. EVANS (*A.M.A. Arch. Derm.*, February, 1959) reports the results of the use of relaxin in the treatment of diffuse progressive scleroderma. He states that relaxin, obtained from the ovaries of pregnant sows, helps to loosen the skin of sclerodermatous patients. Sympathectomy combined with relaxin and diethylstilboestrol therapy brought greater flexibility of the skin in eight of the 11 patients studied, being most effective in the face, neck, yoke, arms, forearms, chest, abdomen and legs. The hands showed a little improvement, such as healing of ulcers or erosions. However, finger mobility was rarely improved. The author has the impression that relaxin has a better effect in sympathectomized areas of skin. All patients were primed with diethylstilboestrol, in doses of 1 mg.

daily, and this was continued throughout therapy. Treatment with relaxin was started in hospital, the drug being given intravenously for three to seven days in doses increasing from 2.5 to 80 mg. in 5% dextrose saline solution. After preliminary intravenous therapy a gel preparation was given intramuscularly in doses ranging from 30 to 50 mg. two to seven times a week. Barium swallow X-ray examination showed oesophageal scleroderma in nine of the 11 patients. Improvement of dysphagia was notable in four patients, including two who had previously required dilatation of the oesophagus.

Lupus Vulgaris following B.C.G. Vaccination.

S. BOULLE, J. CIVATTE AND MADAME M. BOULLE (*Presse méd.*, March 25, 1959) report a case of lupus vulgaris following B.C.G. vaccination, and present a review of 38 cases found in the literature. In their own case, a very large lesion developed on the shoulder of a child vaccinated in that area by scarification. The authors put forward evidence in favour of the tuberculous nature of these cases of lupus, and of B.C.G. vaccination as the causative factor. They discuss the aetiology and stress the occasional incrimination of the virulent nature of the vaccine and the existence in the patient of an allergy to tuberculosis, unknown but present prior to the vaccination.

Skin Eruptions in Colour Film Developers.

P. DE GRACIANSKY *et alii* (*Presse méd.*, February 25, 1959) report eight cases in which lichenoid eruptions or true lichen planus were found in people employed in developing colour film. It was found that the dermatoses were connected with chromogen derivatives with a para-phenylene diamine base. The mechanism of production of the lesions is discussed.

Fungistatic Effect of Hydrocortisone and Its Analogues.

R. L. SAUVAN AND R. L. SUTTON, JR. (*A.M.A. Arch. Derm.*, January, 1959) state that they had noticed the beneficial effects upon many patients with dermatoses clinically resembling dermatophytosis of topically applied hydrocortisone and related chemical substances. They therefore wished to know whether hydrocortisone and certain of its analogues were fungistatic *in vitro*. Hydrocortisone acetate and alcohol and prednisolone phosphate and alcohol, in the concentrations used, displayed no fungistatic properties against the fungi tested.

Keloids.

M. MIENICKI AND H. KOSSAKOWSKA (*Presse méd.*, January 28, 1959), in a paper reporting work done at a hospital for skin diseases and syphilis in Poland, attempt to prove that more serious disturbances than one would think take place in the whole organism during the formation of keloids. They present several cases providing evidence in favour of their belief. One of the most important points is the fact that the patients are often in a state bordering on fever and have an increased erythrocyte sedimenta-

tion rate. The authors state that it is possible, by bringing about the disappearance of these manifestations, or even by relieving them only, to cause the keloids also to disappear. This result is obtained by administering large doses of vitamins and iron. This form of treatment has the further advantage of completely eliminating all local measures and of protecting the patient from possible recurrences. The authors consider that they have presented a new point of view on the aetiology of keloids.

Disseminated Granuloma Annulare.

E. H. MANDEL (*A.M.A. Arch. Derm.*, March, 1959) reports a case of disseminated granuloma annulare which resisted various treatments, including isoniazid, pyridoxine, calciferol, grenz rays, prednisone, etc., and responded to chloroquine phosphate. Chloroquine phosphate tablets were given in a dose of 250 mg. twice a day. After two months the eruption was no longer present, and the administration of chloroquine was stopped. Two months later, the patient noticed the appearance of lesions on the buttocks and upper extremities. Chloroquine phosphate tablets were again given in the same dosage and within one month the lesions had again disappeared.

"Methoxsalen" in the Treatment of Vitiligo.

J. A. ELLIOTT (*A.M.A. Arch. Derm.*, February, 1959) states that repigmentation of vitiliginous skin after the use of "Methoxsalen" and exposure to sun is probably not permanent. Treatment must probably be continued indefinitely, although its intensity can be reduced to a maintenance level once the desired degree of repigmentation is attained. There is apparently no correlation between the degree of pigment retention and the age of the patient, duration of the disease, extent or area of involvement, or maximum degree of repigmentation. A sun lamp is not as effective as sunlight in repigmenting vitiliginous skin, but it is a valuable adjunct in treatment when sunlight is not available. Photographs are important, taken before and after each course of treatment, in evaluating the progress of the patient.

UROLOGY.

Vascular Tumours of the Urinary Tract.

J. B. HAMSHER, T. FARRAE AND T. D. MOORE (*J. Urol. (Baltimore)*, November, 1958), state that vascular tumours or tumour-like masses involve the urinary tract only rarely, and their pathological identification may be subject to much conjecture. The authors outline a classification based on cases (not including ones of varix or telangiectasis) found in the literature since 1951, and they have added one case of their own. The lesions were mostly haemangiomas, either benign or malignant. Renal haemangiomas are small but may be multiple. Because of this, it is necessary to decide on nephrectomy if surgical exploration has to be undertaken. If a kidney is opened

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and one small lesion excised or cauterized, there is risk of other small tumours being present, with the subsequent necessity of nephrectomy. Only four cases of primary vascular tumours of the ureter and only 48 cases of haemangioma of the bladder have been reported since 1941. Vesical angiomata are usually much larger than renal angiomata. Almost one half of vesical angiomata are on the floor of the bladder, and about one quarter of these involve the vesical neck. The majority are small, and are histologically of the cavernous type. Haematuria is the primary symptom but may be associated with retention or with symptoms of cystitis. Bleeding seems to be more severe than from renal angiomata, and may even be fatal. Cystoscopically the tumours have a mulberry or cystic appearance, with red to blue discoloration, and must be differentiated from other pigmented lesions, such as endometrioma or melanoma. Transurethral biopsy should be avoided since it may lead to fatal haemorrhage. Only a small part of the tumour may be presenting in the mucosa, while the bulk of the growth is deep in the wall of the bladder or even in the perivesical space. Wide partial excision of the bladder wall is therefore the treatment of choice, especially as it is also the treatment of choice for endometrioma or melanoma, and no deaths have been reported with this method. Electrocoagulation methods, either by cystotomy or endoscopically, have an over-all mortality of 12.5%. Retroperitoneal haemangioma are extremely rare, only 10 cases having been reported in the literature. All patients were completely asymptomatic, so far as urinary tract symptoms were concerned, except for dull aching or pain in the side. Hydronephrosis is often present, but overlooked and not diagnosed. Often repeated severe haemorrhages may occur. Surgical removal may be highly difficult and dangerous unless there is adequate exposure for thorough ligation of vessels at the periphery of the tumour. The authors state that good delineation of the tumour may be obtained with translumbar angiography.

Partial Cystectomy in Bladder Neoplasms.

H. DONOVAN (*Brit. J. Urol.*, March, 1959) states that the indications for the operation of partial cystectomy in vesical neoplasms are (i) for patients who do not respond to endoscopic diathermy, and (ii) where there is a chance of complete removal without resorting to total cystectomy. One important question is what degree of involvement of the internal meatus makes this operation impossible. Half of the orifice, certainly on one side, can be cut away without causing incontinence. The basic principle is to remove the growth, together with a wide margin of normal bladder, and then to close the gap, reimplanting a ureter if necessary, and restoring the internal meatus if this has had to be partially cut through. The total number of cases reviewed from the author's hospital was 136, and there were three operative deaths. There were 76 five-year survivors, a survival rate of 55%. Total cystectomy had to be done later for three patients, of whom two are

still alive after seven and ten years respectively. Grading and staging were not always carried out, but the tumour was assumed to be infiltrating in 77 of the total of 136 cases. Only 14 specimens were reported as histologically benign. It is questionable whether any form of local treatment can prevent recurrence elsewhere in the bladder. In the present series there were recurrences in 59 cases (43%). As for the risk of renal infection after reimplantation of the ureter, this has been greatly diminished since a routine cover of chloramphenicol was used. The author states that the general impression is that, in suitable cases, partial cystectomy is an excellent operation with a very low mortality and a reasonably quick convalescence, and is probably more effective than interstitial irradiation.

Stricture Developing after Uretero-Pelviplasty.

D. C. MALCOLM AND J. W. DURSEY (*J. Urol. (Baltimore)*, December, 1958) consider that nephrectomy can be avoided when stricture develops after plastic operations in the uretero-pelvic region, and report 12 cases in which this was corrected by a second operation. They consider that the chief factor in causing post-operative stricture was the use of too large (12 to 14 mm. in circumference) a splinting tube at the first operation. Mentioning that Hamm has advised the omission of splints altogether in uretero-pelviplasty, the authors recommend the insertion of two or three small fenestrated polyethylene splints into the renal pelvis, passing them down the ureter for variable distances, thus providing a flexible scaffold upon which mucosa and muscularis may regenerate. The outer ends are tied, and secretions drain down the tubes into the ureter, so that the patient is spared the inconvenience of external drainage. The authors state that infection occurs in nearly all pelviplasties with nephrostomy tubes, but subsides readily if it was not present before operation. To control infection, they recommend giving neomycin by injection in doses of 200 mg. every two or three days for two weeks, and thereafter less frequently. The splints are kept in place for four weeks. When a second operation is necessary on account of a stricture developing after the first operation, sharp dissection is necessary to separate the lower renal pole from the ureter and to mobilize the whole uretero-pelvic junction. Short longitudinal incisions are made on the medial and lateral aspects in the obstructed area, or this is completely resected if no ureteric lumen remains; in the latter case reanastomosis of the split ureter to the renal pelvis will be necessary. Any redundant renal pelvis should be removed, so as to obtain a more funnel-shaped pelvis which will contract better.

Wilms's Tumour.

J. K. LATIMER, M. M. MELICOW AND A. C. USON (*J. Urol. (Baltimore)*, December, 1958) report that, of a total of 67 cases of Wilms's tumour of the kidney recorded at the Columbia-Presbyterian Medical Center, 25 were observed before 1933. Three of these patients were inoperable, and the rest were treated by methods available at that time; the over-

all survival rate was only 9%. Of 42 patients with Wilms's tumour seen since 1933, the over-all survival rate was 38%. Of these 42, 36 underwent nephrectomy, and 16 of these are alive at periods between two and 23 years after the date of operation. Patients who survived beyond two years usually continued to do well. Of children who died after nephrectomy, 85% did so within a two-year period. Females preponderated in the ratio of 25 to 17 males; 15 of the group were under two years old. Age was important in prognosis. About three-quarters of the children operated on under the age of two years are still alive, while only 18% of those operated on between the ages of three and nine years are still alive. A mass was palpable in all patients, but only five out of the 42 had gross haematuria. Hypertension was present in 60%. The erythrocyte sedimentation rate was ascertained in 20 patients, and of 11 in whom the range was high (35 to 90 mm. in the first hour), none survived. Urographic study is the most important single procedure in confirming the clinical impression. The chest and skeleton are examined radiologically; when metastases are present, they are usually in the lungs, not the bones. Pre-operative radiotherapy was an unsatisfactory means of treatment in the four cases in which a full course was given. The best results were obtained with prompt nephrectomy, followed by immediate post-operative radiotherapy. The histological pattern was as follows: predominantly carcinoma, 20 cases; carcinosarcoma, 18 cases; sarcoma, three cases; unknown, one case. No significant relationship between the histological picture alone and survival could be demonstrated. The prognosis is worse in cases in which the tumour is in the upper pole of the kidney, in which it has broken through the capsule, or in which metastases are present.

Unilateral Multicystic Kidney.

M. G. FINE AND E. BURNS (*J. Urol. (Baltimore)*, January, 1959) describe the condition of unilateral multicystic kidney as a congenital disorder resulting from fetal maldevelopment, in which a grape-like mass of cysts replaces renal tissue. In recent years this lesion has been recognized with increasing frequency, but it is still a rare condition, and only 48 cases have been found in the literature, including two cases of the authors'. About 10 to 20 cysts of varying size are usually present, and they completely replace the renal tissue, being held together with loose connective tissue. The ureter is usually absent or rudimentary. Thirty-two of the 48 cases were in infants or children, the rest in adults; 19 were males and 29 females. No hereditary tendency was noted in any case. No entirely satisfactory explanation for the aetiology of this non-hereditary, congenital anomaly has been found. The condition is symptomless, except for occasional pressure symptoms, and is often discovered only during autopsy or in a routine examination. It is to be distinguished from congenital polycystic kidney, which is bilateral. Wilms's tumour and other renal diseases like hydronephrosis. If symptoms are present, nephrectomy can be done, and the outlook is good.

Special Article.

THE DRIVER IN RELATION TO THE PHYSIOLOGICAL LIMITATIONS IMPOSED ON HIM AS A HUMAN BEING.¹

STATISTICS state that some 85% of road accidents are due to human errors, but little attempt is made to analyse these errors in terms of the limitations imposed upon us by our physiological make-up. A great deal of research has been done on the physiological and psychological problems associated with aviation, but obviously much of this is not relevant to driving. I hope that this paper will demonstrate the urgent need for research into the problems raised.

In greater part I will concern myself with things of which we are fully conscious, but I intend to present them with a bias different from that with which the "man in the street" interprets them. To use an analogy: for centuries man observed the earth, the moon, the sun and the stars and interpreted them in terms of a flat earth around which the heavenly bodies circled for his specific benefit and admiration. The revelation of the true nature of things did not alter the facts, but made a profound difference to our overall attitude and knowledge of the facts. I think that a revolutionary attitude in our thinking on the driving problem would greatly assist in combating the toll of the road.

The Limitations of Our Power to Concentrate.

It is impossible for the human brain to concentrate on a single item to the exclusion of everything else for more than an infinitely short time. Even as I have been speaking, I am certain that you have all found your minds wandering; indeed, my very approach has probably sent your thoughts cascading into a diversity of channels. This, then, is the first physiological limitation we must recognize—namely, that the human brain is so constructed that we cannot control its activity by the conscious will. We can channel our thoughts in a general direction, but that is all. A stimulus of any kind arising extraneously is sufficient to divert our attention from what has been occupying it, and if no stimulus arises and we are left to concentrate only on what arises in the brain, we become drowsy.

It is, therefore, of the greatest importance to analyse the factors which allow us to keep sufficient of our attention channelled on driving, or as we term it, to allow ourselves to concentrate on driving. It is impossible to devote the whole of our attention solely to driving, and impossible to drive if we do not devote sufficient attention. What thought do most of us give to the factors that make it possible for a driver to control a vehicle for many hours at a time? We take it all for granted. It is certain that we require a continuous stream of stimuli to pass to the brain, for if there were no stimuli we should be unable to drive for any length of time without falling off to sleep. On the other hand, if stimuli are out of a certain range they act as distractions and lessen our ability to concentrate—a flashing light, a loud noise, becoming engrossed in a conversation, etc. We must conclude, therefore, that in order to concentrate on driving we require a constant stream of mild stimuli.

A Classification of the Categories of Stimuli.

Table I is taken from an article by Fletcher N. Platt in *Road Safety and Traffic* (1958, Volume 6, Number 2).

From Table I, one can appreciate that the stimuli which reach the brain come from a large number of sources and may vary in importance over an extreme range. It must be recognized as fundamental that, to be effective, stimuli arising from any given source must vary in intensity, otherwise the brain fails to take cognizance of them. For example, on entering a room one is conscious of an odour, but after a short time, though the peripheral sense organs of smell continue to send stimuli to the brain, one does not smell it, but one is immediately conscious of any new odour which may arise.

The limitations of hearing are similar; if one is in a room where there is a constant sound of constant intensity, after a comparatively short time one ceases to hear that sound, but any other sound one hears immediately.

This physiological limitation of the brain to appreciate indefinitely a constant stream of stimuli of the same strength from the same sense organ cannot be over-emphasized in its importance to driving.

¹A paper read before the Institute of Transport in November, 1958, at Sydney.

To illustrate my point, let us consider what would be the result of driving a perfect car—i.e., one that was silent and smooth-running and provided a constant warm internal temperature, etc., on a perfectly smooth road over a perfectly level uniform country without any other traffic on the road and no distractions (stimuli in the form of radio, companionship, etc.). It is obvious that we would not go very far without going off to sleep. As you are all aware, this hazard is already a serious problem on super-highways. It is obvious that the more closely we attain to "ideal" motoring conditions, the closer we come to taking away from the driver the very stimuli which allow him to concentrate on driving.

We must conclude, therefore, that the fundamental requisite for concentration on driving is not only a constant stream of stimuli, but a constant variety in the source and intensity of these stimuli. In other words, we have the paradoxical situation that in order to concentrate on driving we have to have our attention continuously diverted from driving. It is obvious that physiological problems of this nature give great scope for research work. A little thought reveals that the traffic problems we encounter on the road are a series of diversions which not only make us concentrate, but are stimuli which enable us to concentrate.

TABLE I.
Outline of the Sensory Processes.
(After Platt, 1958, Table VII.)

Sense Modality.	Sense Organ.	Psychological Phenomena.	Relation to Driving Task.
Visual.	Eye.	Light and shade.	Most important.
Kinaesthetic.	Muscles.	Location of members and movement.	Important.
Static (equilibrium).	Semicircular canals.	Equilibrium, acceleration and deceleration.	Important.
Auditory.	Ear.	Sound (noise, tone).	Important.
Olfactory.	Nose.	Odours.	Emergency situations. Indirect.
Organic.	Viscera.	Hunger, thirst, fatigue, etc.	Indirect.
Pain.	Skin and viscera, head.	Pain and discomfort.	Indirect.
Thermal.	Skin.	Coldness.	Occasional.
Thermal.	Skin.	Warmth.	Occasional.
Tactile.	Skin.	Touch.	Occasional.
Gustatory.	Tongue.	Tastes.	None.

An Analysis of the Limitations of the Eye as a Sense Organ.

The eye is the most important of all the sense organs, and in its relation to driving there are two independent problems for consideration. Firstly, there is the question of its efficiency from the optometric point of view—e.g., astigmatism, myopia, cataract, etc. The optometrists are now taking an active part in stressing the importance of "good" eyesight, and I have neither the knowledge nor the courage to trespass into their domain.

Let us assume that all drivers have "good" eyesight, and turn to a consideration of the physiological limitations which nature imposes on us. Firstly, we must recognize that a constant visual stimulus is neglected by the brain, as are constant stimuli from other sense organs. For example, if we pass from a room lit by an illuminant of one colour into a room lit by another colour we are immediately conscious of the change, but after a very short time we become unconscious of it.

Up till this stage I have spoken more or less on generalities, but it now becomes important to relate some of the findings to their practical application. We can begin by applying the fact that the brain neglects light of a constant colour to what frequently happens at night. Our eyes are being constantly stimulated by red—red tail-lights, stop lights, parking lights, lights for road repairs, advertising lights, traffic lights, etc.—so that under certain conditions it is quite easy for the brain to fail to be conscious amongst all the other red lights of a traffic light. The driver who goes through a traffic light is fined, though he protests that he did not see it, and though he may be a most careful driver. Obviously the fault is not the driver's, but that of the authorities who allow lighting conditions to be such that the traffic light does not present at all times and under all conditions an adequate stimulus. In my opinion the motorist is no more guilty of an offence than are we in this room who can no longer smell the odour of the room.

The first principle to be observed in designing and placing warning lights is that they should be different in colour from all other lights in their vicinity. This is a matter which should be the subject of propaganda for all bodies interested in road safety.

Next let us pass to another important aspect of vision—namely, accommodation. Accommodation has to deal with the ability of the eye to vary the amount of the pupil exposed. This is brought about by contraction and relaxation of the iris. As everybody knows, the pupils are larger at night than during the day. If we pass from the bright sunlight into a dark room we cannot see for an appreciable time, during which period the iris is relaxing. With advancing age two things happen—first, there is a decrease in our ability to accommodate rapidly, and secondly, we require a greater source of light to see.

Let us apply these facts to driving. There is little need to stress the effects on vision of the setting sun or reflections from shiny surfaces, or on the other hand, of running from a patch of sunshine into a patch of fog, etc.; but it is important to consider what may happen when we have been following a car with very bright tail-lights for many miles before it turns off the road and leaves us behind a car with an inadequate tail-light. An appreciable time elapses before we see the light, and a longer time before we are able to judge the distance between us and the light. The general tendency is to place the dim light further away. This may lead to a sudden need to apply the brakes with considerable force, and on a busy road this leads in turn to other cars braking suddenly, with the result that collisions occur several cars further back. We have all had experiences of such happenings; they are probably one of the most frequent causes of accidents in which the true nature of the events are never appreciated.

Obviously there is an urgent need to fix a maximum and minimum luminosity for tail-lights and other rear lights.

The next problem to engage our attention is our field of vision. If the eyes are focused on an object straight ahead, we can see objects contained within an angle of some 120°, the actual angle being an individual variant which is important in relationship to the relative ability of drivers to see objects approaching from the side—objects outside the field of vision are, of course, not seen. The field of vision has been compared to an island of light in a sea of darkness. We now have to consider the limitations imposed by our fields of vision in relation to driving. Obviously, the denser the traffic and the greater the speed, the more our eyes are focused on the road and generally on the centre of the road; on the other hand, notices are always placed to the left of the road. At high speeds such notices may be in the field of vision for only a very short interval of time, or may not be seen at all. Hence it comes about that the more carefully a driver is concentrating on the road, the more likely he is not to see a speed restriction sign. A very good example of this is at Kelso near Bathurst. The road before Kelso is probably the best stretch on the whole journey and there is a natural tendency to accelerate; then one begins to meet traffic coming from Bathurst, and as both streams are travelling at high speed one gives all one's attention to the road and the 30 miles-per-hour sign is not seen.

In my opinion, when a motorist claims that he did not see a sign, he should not be told bluntly that failing to see a sign is no defence and fined and the matter allowed to end there. There is an urgent need to investigate all such cases with a reproduction of the conditions obtaining at the time, so that the important decision can be made as to whether or not such signs are adequate. The purpose of signs is to give information to the motorist in order to make driving safer. Their purpose is not to act as traps for the unalerted but careful driver. No sign is adequate that can be missed under driving conditions to which a competent motorist may be exposed.

The Discriminatory Selection by the Brain of Specific Stimuli from the Totality of Sensory Impulses.

Enormous numbers of impulses are constantly being sent to the brain from the various sense organs. From these impulses our brain at any one time makes a conscious selection and ignores all others. As this phenomenon is of great importance but seldom appreciated, it is necessary to deal with it in some detail. Let us consider a few examples.

It is well known that a mother will sleep soundly through a spate of extraneous noises, but will awake at the first cry of her young baby. Again, if one is in a room where a conversation is going on but one is intent

on waiting for a clock to strike, one will be quite oblivious to the import of the conversation. On the other hand, if one is engrossed in the conversation, one will not hear the clock strike. Obviously in both these examples the same impulses reached the ear drum, but the mind was conscious only of the stimuli it was conditioned to hear. How often are we reproved for not "listening"?

Stimuli falling on the retina are similarly selected by the brain. There can be no doubt that the retina is stimulated by every object within the field of vision, just like the photographic plate in a camera; but from the totality of images striking the retina, the brain is conscious only of those that it is intent on seeing at the particular instant, and neglects all else.

Every microscopist is well aware of this phenomenon. For example, when one is intent on examining white cells in a blood film one completely ignores the more numerous red cells, though obviously they are being reflected onto the retina and one "sees" them immediately one "directs one's attention" to them. An excellent example of the manner in which the brain neglects quite obvious objects which fall onto the retina was told to me by a medical artist. He had been asked to photograph, by a most meticulous professor, a microscopic field illustrating some peculiar cancer cells. When he examined the field before setting up the photographic equipment, he remarked to the professor: "There is a large piece of foreign matter in the field." The professor had been so intent on finding cells which illustrated some important feature that he had not "seen" the foreign matter, which would, of course, have spoilt the photograph. It is a commonplace that if one wants to show a novice something under a microscope, he invariably picks out some extraneous object which one's own eye has completely neglected, because it was unimportant.

It is obvious that this physiological attribute of the brain to select certain things from the totality of visual images has important implications in relation to driving; for example, it is easy to understand that if a motorist is concentrating on avoiding pedestrians he could easily fail to see other objects in his field of vision. How often do we reply to a passenger: "I did not see so-and-so as I was concentrating on so-and-so". In general it may be stated that two people sitting alongside each other in a car, and both intent on watching the road ahead, will not register in the brain the same set of objects, although the total number of images falling on their respective retinas will be approximately the same.

The conclusion to be drawn from all this is that the more carefully the attention is concentrated on one set of objects in the complex kaleidoscope of the road, the more prone the driver is to fail to "see" other objects. In other words, we do not "see" with the eye but with the brain, and the brain "sees" only what it wants to see, or rather what it has conditioned itself to see at the particular time.

Obviously the solution to this dilemma is to control traffic conditions in such a manner that the motorist is not required to take cognizance of a multiplicity of different factors at the one time. There are many practical ways in which the motorist could be helped in this matter, especially in cities.

Another important factor in the over-all problem is the number of visual stimuli which can be seen, registered and analysed in a given period of time. According to Platt, about one object per second can be dealt with, so that at a speed of 60 m.p.h. a driver travels 88 feet per analysed stimulus. Obviously a great many events will go unseen, or if they are seen will fail to be analysed.

The Practicability and Advantages of Supplementing Visual Stimuli.

The recognition of the limitation of the visual mechanism to deal with more than one stimulus per second makes it important to investigate alternative means of alerting the motorist to traffic requirements.

While pursuing some research into reflex actions, at the University of Sydney, I discovered that if an auditory and visual stimulus reached their respective sense organs simultaneously, then the auditory stimulus reached consciousness before the visual stimulus and the auditory stimulus was dominant in evoking a reflex action. Later I ascertained that this discovery confirmed work already done in America.

This phenomenon could be put to a most important use. We all know that the brain is capable of responding to more than one stimulus at the same time, so that auditory stimuli could be used to supplement visual stimuli. By

means of radar, impulses could be propagated from various traffic signs—e.g., 30 m.p.h. restrictive signs, traffic lights, pedestrian crossings, open railway crossings, etc.—and be picked up in a car by a receiving set which in turn would emit an auditory stimulus. By this means, while the motorist was concentrating his vision on the traffic, he would be warned by these auditory stimuli of the need to curtail his speed. As an example of the advantage of such auditory stimulation, one could instance the increased safety factor if an advanced auditory stimulus gave warning that the green light was about to change to orange. This would be especially valuable when traffic lights were at the bottom of hills.

In the ninth annual report of the Commonwealth Scientific and Industrial Research Organization, 1956-1957, at page 125, reference is made to the discovery in the Division of Radio-Physics of crystal "transistors" which "can substitute very effectively for electronic valves in many applications, with substantial economies in space, weight, power consumption and heat dissipation, together with improved reliability". It would appear, therefore, that by cooperation with the Department of Radio-Physics, there is no reason why Australia could not lead the world in inventing and applying effective auditory warning signals.

This analysis of the limitations of the eye and brain in their ability to account for all the visual stimuli which occur in driving is by no means complete. I am not an expert physiologist; but I bring them forward to demonstrate how urgent is the need for careful research into such problems.

The Semicircular Canals in Relation to Driving.

Before leaving the sense organs it is pertinent to discuss briefly the semicircular canals, which are responsible for our sense of equilibrium and play an important part in our appreciation of speed. If one sits in a car with the eyes closed, one is conscious of motion, but not of absolute speed. If the car is travelling at 50 m.p.h., one knows that one is travelling, but has no conception of the rate; however, if the driver slows to 30 m.p.h., one is immediately conscious of the change in speed—indeed, one has the sensation of "crawling" along. Here again we have the same phenomenon of a constant stimulus being ignored by the brain.

Enough has been said to illustrate the complicated nature of the physiological problems associated with driving; the problems are there, but like many human activities, we take them all for granted.

The Effects of Stimuli.

We pass from the nature of stimuli to a brief study of their effects. We can divide stimuli into two broad categories, those that are advantageous and those that cause irritation beyond their degree of usefulness—we shall call this latter category mental traumas. Now the number and kinds of stimuli which cause mental trauma are legion; they vary from the person who pulls out from the kerb without a hand signal, to skids, traffic jams, etc. Also, whether a given stimulus will cause mental trauma will vary with the individual's make-up, and with the individual from time to time according to his humour, his well-being, his degree of fatigue, his experience, and whether he is in a hurry, etc. Irrespective of all these qualifications, mental traumas are all too common. As a great number of them are fortuitous, it is the more important that every effort should be made to reduce to a minimum those that are static and structural. Here is a most fruitful field for remedial action on the part of those authorities who are directly concerned with traffic. The number of mental traumas caused by badly placed stop signs, by badly lit streets, by dangerous curves, by defects in road surfaces, etc., is incalculable, yet a great number of these defects could be remedied for a few pounds each. There can be no doubt that mental trauma affects our health, so that attention paid to reducing its incidence falls within the realm of preventive medicine.

A Consideration of Efferent Stimuli.

We have been dealing with stimuli which pass from the outside to the brain, and we must now turn to consider the stimuli which pass from the brain to various parts of the body. These stimuli determine the responses the driver will make. Now the responses of a trained driver are different from those of a novice, and we all have our special way of denoting these differences—some not too polite. The responses of a trained driver are the result of long experience in dealing with a given range of traffic conditions and are carried out rapidly and effectively. We

refer to such type of response as being "automatic" or "unconscious" or "instinctive", and one often hears the expression: "I drive better when I am not thinking about it." A great number of everyday actions fall into this category; we could take the act of swallowing as an example. It is easy to convince ourselves that we can swallow more efficiently unthinkingly than when we make a conscious effort. In scientific terms, we can describe all such responses which eventuate without the conscious will as reflex actions. All such reflex actions short-circuit our highest centres—i.e., consciousness—and by doing so they are executed more rapidly and in general more efficiently than when they are voluntary conscious actions. We do not know the exact paths which such reflex actions take in traversing the neuro-muscular system, but they certainly play an essential part in efficient motoring. We can illustrate these phenomena by the rapidity with which the foot comes onto the brake and the arm gives the stop sign when the stop-light of the car in front comes on. The experienced driver does this without any conscious action on his part. The novice, on the other hand, makes a conscious action out of it, and as we all know, does it less efficiently.

In quite a different category of driver responses are "driver habits". These are purposeful voluntary decisions, which follow a pattern of behaviour specific for the individual, but which are liable to change—and, indeed, we direct propaganda to the purpose of effecting change. Driving habits involve such things as giving way to stationary cars wishing to cross a thoroughfare or pulling up to allow a forlorn pedestrian to cross. The decision made in each eventuality is determined by the conscious mind; such actions can never become reflexes, because each requires judgement and a specific decision on the part of the driver, and this decision has to be determined after an analysis of a number of stimuli crowding in from various sense sources.

From the foregoing considerations two conclusions can be drawn in relation to driving instructions. First, it would be of great advantage to establish relevant reflex arcs before a learner takes to the traffic. Secondly, courteous "driver habits" should be taught as a creed and form part of the examination for a licence.

Conclusion.

I have given a brief outline of the driver as a normal human being; but it is obvious that all drivers are not normal, nor is anyone always normal. We are the victims of illnesses, headaches, worries, emotional disturbances, fatigue, etc., all of which tend to exaggerate the limitations of our sense organs and affect our reflex responses; and though in the sum total of road accidents and near-accidents such factors must play an important part, their effect is insignificant compared with the toll of the road caused by alcohol. Indeed, the effect of alcohol on the over-all efficiency of drivers is so important that it must receive separate consideration.

F. S. HANSMAN,
Sydney.

On The Periphery.

WHAT MADE THE CLOCK TICK?

WHEN I was a small boy, I carried out an experiment on a grandfather clock which my father, who had a clock complex, held in especial affection. I climbed up a short stepladder, and with a gimlet bored a hole in the woodwork at about the level I considered to be that of the ticking mechanism. Resistance was met, and I pushed hard. Something happened; there was a whizzing sound, and the hands raced round the dial too fast for the striking mechanism to keep pace. My father was very angry over this treatment of his pet time-piece: "I feel the place in wintry weather still." As is usual with parents, he failed to appreciate the intellectual stimulus I received, as also the chain of reasoning which the experiment inaugurated in my mind. Later when I became a medical student, I began to realize the far-reaching importance of my find. Put briefly, gimlets are the cause of the clock's activities. A clock which gains is hypergimleted, one that goes slow is hypogimleted. The objection that gimlets are not seen when the works are exposed is easily explained by the hypothesis that there is a gaseous precursor, gimletogen, which is acted upon by a gaseous horozyme. The removal of the gimlet after it has carried out its specific

action can be attributed to a gimletoclastic enzyme. That lubricating oil can quicken the tempo may possibly arise from its action on gimletogenase.

Kangaroo Ground,
Victoria.

W. A. OSBORNE.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

A SURGEON GOES TO WAR.¹

[From the *Australasian Medical Gazette*, May, 1896.]

SURGEON CAPTAIN T. H. FIASCHI, of the N.S.W. Forces, has been appointed to the medical staff of the Italian Army in Abyssinia. It would appear that Dr. Fiaschi's services are welcome, for according to the Rome correspondent of the *Lancet*, as many as fifty army surgeons were killed or left for dead on the fatal field of Abba Carima, the total killed of all Italian forces in that battle being nearly 10,000 men.

Correspondence.

REACTION FROM "TRILAFON".

Sir: I am writing to report an unexpected and rather frightening reaction in a patient taking "Trilafon". A married female patient, aged 30, had previously been treated for nervous manifestations by me, including a severe hysterical fit one and a half years ago which required an injection of three grains of sodium phenobarbitone. On May 20 last she contracted influenza, and, as a week later she complained of exhaustion, I ordered her "Trilafon" 4 mg. three times a day. After taking the second tablet, her eye muscles spasmed so that they were drawn upwards, only the whites showing. This wore off after a couple of hours. When she took the third tablet, she had severe spasm of the neck and face. Her head was pulled to the right with neck extended, mouth pulled open and to the right, and eyes pulled upward. She was conscious and perfectly rational, although very frightened. I gave her an injection of three grains of sodium phenobarbitone, thinking that the cause was hysteria. On returning home, I consulted the leaflet published by the proprietors, and found the following: "muscle spasm, particularly in the neck and shoulder, has been noted occasionally." The spasm slowly eased and by the following morning, 12 hours later, she was quite normal. I conclude that this patient's signs and symptoms were due to "Trilafon".

Yours, etc.,

Balcombe Road,
Mentone,
Victoria.
June 8, 1959.

PHILIP GOODMAN.

BE IT ENACTED.

Sir: In his address as retiring president of the Tasmanian Branch of the British Medical Association, Dr. McL. Millar takes us with him on his interesting explorations of the medical Acts from which our State medical boards derive their powers, and the Articles of the British Medical Association. He is not, like Cortés, silent with wonder, and he gently exhorts us to recall, remember and make known the less obvious but more worthy objects of our Association. The wisdom of this is indisputable and the reminder timely. At the same time, he feels that it would be desirable to have some uniformity in the State Acts, Queensland having a model, if not perfect, Act, and Victoria, at the other extreme, lacking the definitive precision and breadth of power which, it would seem, help to make an Act more model.

¹ From the original in the Mitchell Library, Sydney.

Few would question that legal uniformity is desirable within the Commonwealth, and it is implied that any such legislation for this purpose would embody many, if not all, the features of the Queensland model Act. It is here, sir, that I must rise in protest from my Æsculapian bed, and defend the principle of medical freedom from the tyranny of legal perfectionism. If there is to be uniformity, then let us think deeply before squandering our liberties, which alone confer upon our profession the dignity of a calling.

If the Victorian Medical Board suffers from constitutional frustration, I am unaware of it, and I would find it difficult to believe that it is in any way servile or senile, or even maimed by legislative inadequacies. Whatever may be the paucity of its powers, it has dealt, as far as I know, with complete satisfaction with the political balls delivered over recent years.

A student walking the halls of fusty Victorian medical halls and schools no doubt becomes imbued with the spirit of gravity and antiquity by the portraits of his professional mentors, who all wear the Hippocratic look. Later, on graduation, he pays a fee, takes the ancient oath and signs the register. With it goes the blessing of this Mother Grundy Board, which thereafter expects him to live as he has been taught, and seek his self-expression in the pursuit of health and happiness for his fellow men. As far as I know, the disciple rarely requires recall for discipline, and he continues to practise without further fuss and bother from his Board for the rest of his life. The only communication he receives is an occasional letter from the Secretary of the Board, politely inquiring whether he is still in practice, and whether he has changed his address.

Contrast this with Queensland Board practice, and New South Wales too, where he is deregistered if he fails to pay his annual fee by due date, and a fee of three guineas (in Queensland) to have his name restored. In the meantime, he may continue to practise illegally if he so desires; but what is his position if, bidden by his humanity, he renders aid to the victim of a motor accident, and finds himself sued as a result of it? Or, with death more likely, should he do a tracheotomy and invite the censure of the coroner and the Board?

Of other States, I have no knowledge.

Sir, in this world of fast vanishing myths, there is still one Father Christmas, and he is the doctor, who in Australia holds a position unique in society. This extraordinary status has not resulted from legal direction, but from the fostering of the highest ideals of selfless service, and I would venture to suggest that so long as the medical boards allow the incense from the Hippocratic urn to lick our nostrils, we shall continue in our voluntary devotion to our cause.

It is anathema to the zealous idealist to find that, like the plumber, he must register with a disciplinary body; far better to remove the necessity for such temporal control.

Perhaps the Victorian Medical Board might be prevailed upon to tell how it exercises such apparently effortless control, with such few powers, and perhaps we might ask why the Queensland Board found it necessary to lay down such rigid rules for the governing of medical men in that State.

Yours, etc.,

"Tchillool Park",
Barham, N.S.W.
June 11, 1959.

GAVAN GIBSON.

ALCOHOL AS A FACTOR IN MEDICO-LEGAL SUDDEN DEATHS.

Sir: Reference Dr. Minogue's letter (MED. J. AUST., June 6, 1959).

One grows weary of extravagant statements in regard to the problems of the effect of alcohol on the human organism. If those who go into print on this subject would first read the scientific literature, which is unanimous in its findings (though the scientific methods used are of many varied types and the workers of many nationalities) they would at least control their exuberance.

A statement such as "there seems to be present on some days a capacity to drink enormous quantities of alcohol without showing the traditional signs of alcoholism. On other days, their reactions to even small quantities of

alcohol are violent" is as unscientific as it is exaggerated; "seems to", "enormous quantities", "traditional signs", "violent reactions" may serve the purposes of some clinicians, but is foreign language to the scientist.

In this important social problem, let us have, not "in vino veritas", but "in scripto veritas".

Yours, etc.

143 Macquarie Street,
Sydney.
June 17, 1959.

F. S. HANSMAN.

AUTONOMIC DYSPRAXIA.

SIR: I would like to draw attention to two recent events, which created wide interest in the daily Press through the apparent mystery of their cause, but which are easily understood in the light of modern physiology. The first was the sudden collapse and death of a middle-aged man at police headquarters, when he was being questioned in connexion with a robbery. The second was the death of the space monkey, Able, under an anaesthetic for a minor operation. Both are classical examples of autonomic dyspraxia.

Autonomic dyspraxia has been defined (Haynes¹) as a condition of instability of the autonomic nervous system of central origin, caused by an emotional overload, usually of fear, which results in the peripheral malfunction of plain-muscle or glandular structures. The sequence of events at police headquarters points strongly to the deceased being under emotional strain for a considerable period. A lorry driver, he was stopped in the course of his routine duties, and taken to headquarters for questioning about robbery. From the Press it appears that a post-mortem was carried out, and he was found to have died from some type of coronary pathology. According to the hypothesis, the peripheral malfunction of plain-muscle was a spasm of the plain-muscle of the medial layer of his coronary vasculature; in a fatal case such as this, an intense and widespread spasm. Atheroma of the coronary arteries was found to be present, illustrating a further component of the hypothesis—namely, that preexisting local pathology often determines the site of the peripheral malfunction. The deceased, although in apparent good health, actually possessed coronary arteries in which atheroma was present. The emotional overload through his cortico-thalamic tracts to his hypothalamus caused a pathological structural change at the molecular level designated commotio hypothalami, which interfered with the physiological coordination and control of the autonomic nervous system by this central structure. For a period, comparatively short in this case, it was a question of in which peripheral structure would autonomic malfunction occur. This was determined by defective (atheromatous) structures under autonomic control being present in his heart, and these structures being subjected to increased physiological activity—namely, the tachycardia of excitement and/or fear. Through the short time factor involved, the relationship between cause and effect is more evident than in the aviation case discussed previously (Haynes²).

The case of the space monkey has been publicized in the world Press. The released facts are: that the monkey was given some training for its space ordeal; that it survived the unnatural experience for some days without any apparent ill effect; that it died suddenly under anaesthesia, when a minor operative procedure was being carried out; and that the authorities concerned did not consider that the monkey's death was in any way connected with its space episode. I think they are wrong in their conclusion, and I think their opinion should be challenged for two reasons. In the first place there is the general interest of truth and science. In the second place men's lives will be risked on these data and the conclusions drawn from them. Having studied many aspects of this problem for twenty years, widely in the literature and extensively in clinical cases, I am convinced that the monkey perished from autonomic dyspraxia caused by fear, just as the lorry driver died from a similar mechanism. I believe that autonomic dyspraxia is the mechanism involved in this type of otherwise inexplicable death under anaesthesia. The condition can be diagnosed clinically and instrumentally in stage I, i.e., before the hazardous trigger process such as an anaesthetic or space trip is undertaken. The problem of autonomic dyspraxia

and each man's hypothalamus is as formidable as any other major problem in space travel. It is all the more formidable in view of the fact that it is still unknown to those most concerned.

The reported failure of one monkey to tap the Morse key, which it had been trained to tap, is another but less serious case of autonomic dyspraxia. This illustrates the role of the involuntary, autonomic nervous system in activity, which appears to be completely voluntary and under the control of the will. A skilled hand movement, such as tapping a key, involves much more than a purposeful act of the will, activation of the motor cortex and stimulation of the flexor muscles concerned through the pyramidal tracts. The many muscle units concerned have to be coordinated, and their antagonists have to be inhibited *pari passu*. At the same time, extensive neuro-vascular reactions for the blood supply of the active structures have to take place. Both the neuro-muscular coordination and the neuro-vascular coordination are autonomic functions, and are completely involuntary. If either or both of them falter or fail, we have the paradox of the subject being unable to carry out a "voluntary" movement. If compensation or money is involved, some expert quickly reports that the patient "will not" perform the movement, failing to realize the precise nature of the neurophysiology.

When the autonomic dyspraxia is gross, and such biasing factors as money and personalities absent, as in the case of the space monkey, the broad emotional nature of the condition is generally acknowledged, especially by those who are not burdened with a little knowledge. The man in the street quite rightly sums up the situation in saying "he was paralysed with fright". The inseparable autonomic activities of fear and of all emotions have their final common pathway through the hypothalamus, the afferent inflow being through the cortico-thalamic tracts from the association areas of the sensorium. With maximum inflow, as occurs in extreme fear, the hypothalamic circuits are overwhelmed, and all, or nearly all, autonomic activity fails. The patient is aware of what is happening, but can do nothing effectively. He might take a few, ineffective steps, as if drunk. He has initiated voluntary movement, but its effective, autonomic fulfilment is never consummated. Such was the case with the space monkey and the failed signal tapping. Partial degrees of the same condition are necessarily more difficult to appreciate, especially as they often persist to chronicity in one limb or one muscle group, such as the shoulder girdle. In fact, the concept of man's physiology and pathology revolving around his hypothalamus appears to be as incomprehensible to this generation, as the earth revolving around the sun was to the learned contemporaries of Copernicus.

Yours, etc.,

BRIAN HAYNES.

185 Macquarie Street,
Sydney.
June 10, 1959.

WORKER'S FUTURE RIGHTS AFTER SETTLEMENT OF CLAIM.

SIR: The schedule for lump sum payments under Section 16 of the *Workers' Compensation Act* (to cover permanent loss of the efficient use of a part) seems well enough known, but the right of a worker, subsequent to such a settlement to continuing benefits, both medical and hospital, does not appear invariably to be explained to him by insurance offices or the patient's doctor. A letter from the registrar is quoted in confirmation and elaboration.

12th May, 1959.

Dear Doctor,

I have to refer to your letter and to confirm that an election by the worker under section 16 to accept the lump sum equivalent provided by that section for a determined percentage loss of use, whilst terminating weekly payments, does not affect the worker's future rights to medical and hospital benefits under section 10.

It is, however, essential to determine that an election under section 16 only has been made. In many cases a lump sum settlement of a claim may be agreed upon by the worker and the insurer either by way of settlement—where there is a dispute as to liability on some ground or another—or by way of redemption of weekly compensation under section 15. In both cases the agreement of the parties may expressly include liability for all future medical expenses and an agreement in these terms when made the subject

¹ "Autonomic Dyspraxia", Lewis, London.

² "Autonomic Dyspraxia as the Cause of Rheumatoid Arthritis and Related Diseases", *MED. J. AUSTR.*, 1: 488.

of an award of the Commission would affect a termination of the employer's and the insurer's liability for future medical treatment.

H. LEAROLD, Registrar.

It is suggested that practitioners take especial note of these provisions to make sure that their patients are not deprived of benefits to which they are properly entitled.

May I also suggest that doctors dealing with compensation cases should keep a copy of the Act with them for reference; it is not very large or unduly complicated—nor, seeing that I have one, very expensive.

Yours, etc.,

C. C. MCKELLAR.

143 Macquarie Street,
Sydney.

May 26, 1959.

EARLY SUDDEN DEATHS IN THE PROFESSION.

SIR: When will doctors heed what Dr. Paul White, the heart specialist, lectured: "Heart troubles are our own fault, walk more and eat less."

Yours, etc.,

A. E. FINCKH.
(Aged 93).

5 Kirkoswald Avenue,
Mosman, N.S.W.
June 15, 1959.

The Royal Australasian College of Physicians.

FITNESS OF DRIVERS OF PUBLIC SERVICE VEHICLES.

THE following statement on standards of fitness of drivers of public service vehicles who are suffering from coronary heart disease and/or hypertension has been forwarded by The Royal Australasian College of Physicians.

Drivers of Public Service Vehicles with Coronary Heart Disease and/or Hypertension.

It should be emphasized that any opinion expressed or recommendations made in the following report refer only to drivers of public service vehicles, whose sudden death or sudden loss or impairment of consciousness while driving might result in loss of life or serious injury to members of the travelling public. An entirely different approach should be made regarding drivers of private vehicles.

Coronary Heart Disease (Ischaemic Heart Disease).

A recent survey of the health of bus drivers in London Transport (Norman, 1958) showed that "coronary thrombosis" was the commonest single cause of sudden loss of consciousness while driving. Agreement is expressed with the general conclusion reached by Norman, re-phrased as follows:

Persons known to suffer from ischaemic heart disease should not drive public service vehicles.

1. A diagnosis of myocardial infarction (commonly due to coronary thrombosis) should exclude a person from driving public service vehicles even after recovery from the illness.

2. A diagnosis of angina pectoris should exclude a person from driving public service vehicles. The risk of sudden loss of consciousness while driving is probably as great in persons suffering from angina pectoris as in those who have recovered from myocardial infarction.

3. Sudden death or loss of consciousness due to ischaemic heart disease may occur in persons who have had no previous symptoms or signs of the condition. In the present state of medical knowledge there is no certain method of detecting coronary heart disease in such persons; but a routine electrocardiographic examination may show abnormalities in a proportion of them. It is suggested that an electrocardiogram should be included in the routine periodical medical examination of drivers of public service vehicles at the age of 45 years and thereafter. Unequivocal electrocardiographic changes indicating previous myocardial infarction should exclude a person from

driving public service vehicles, even in the absence of symptoms.

4. In individual cases, in which there is reasonable doubt as to the presence or absence of ischaemic heart disease, it is suggested that the opinion of one of a panel of cardiologists should be sought.

Hypertension.

The review by Norman, to which reference has already been made, showed that hypertension *per se* was a very rare cause of sudden loss of consciousness while driving. In this regard it is held that evidence of hypertensive and/or atherosclerotic vascular disease (cerebral, retinal, cardiac or renal) is much more important than the actual levels of blood pressure recorded. It is, however, recognized that persistently raised pressures of sufficient degree will eventually lead to progressive vascular disease. The following recommendations are therefore made:

Persons with evidence of hypertensive vascular disease should not drive public service vehicles.

1. This evidence, which should be sought in persons found to have blood pressures above average normal figures for their age, may be summarized as follows: (i) cerebral—a history of "stroke" or transient loss of cerebral function, or any residual neurological abnormality on physical examination; (ii) retinal—grade 3 or grade 4 changes according to the classification of Wagener and Keith (1939); (iii) cardiac—unequivocal cardiomegaly on X-ray examination, or electrocardiographic abnormalities consistent with left ventricular hypertrophy and/or myocardial ischaemia; (iv) renal—albuminuria together with the presence of red blood cells or casts on microscopic examination.

2. A person who has a systolic blood pressure persistently higher than 200 mm. of mercury or a diastolic blood pressure persistently higher than 110 mm. of mercury should not drive public service vehicles. If there is no evidence of vascular disease as indicated in paragraph 1 above, and if the blood pressure can be effectively controlled by treatment without the use of ganglion-blocking agents, such a person may be permitted to drive, but should be reviewed at intervals of six months.

3. Persons being treated with ganglion-blocking agents should not drive public service vehicles because of the risk of hypotensive episodes with impairment of consciousness.

4. Persons found to have blood pressures above average normal figures for their age at examination prior to employment as drivers of public service vehicles should not be employed as drivers.

5. The average blood pressure may usually be obtained by averaging two series of three readings (recorded on different days) taken at 5 to 10 minute intervals. For individuals up to 40 years of age the average systolic blood pressure should not exceed 140 mm. of mercury and the diastolic 90 mm. of mercury. At 50 years of age the corresponding figures should not exceed 150 and 94. This procedure would be necessary only if initial readings exceeded 140/90 or 150/94 mm. of mercury respectively.

References.

- NORMAN, L. G. (1958), "The Health of Bus Drivers", *Lancet*, 2: 807.
WAGNER, H. P., and KEITH, N. M. (1939), "Diffuse Arteriolosclerosis with Hypertension and Associated Renal Lesions", *Medicine*, 18: 317.

Medical Matters in Parliament.

HOUSE OF REPRESENTATIVES.

THE following extracts from *Hansard* relate to the proceedings of the House of Representatives on April 21, 1959.

Hospital and Medical Benefits Scheme.

MR. REYNOLDS asked the Minister for Health, upon notice:

1. What are the names and vocations of the persons constituting the boards of directors of the Medical Benefits Fund of Australia Limited and the Hospitals Contribution Fund of New South Wales?

2. By whom are these persons elected to these boards?

3. Do the boards contain representatives of contributors elected in that capacity?

DR. DONALD CAMERON: The answers to the honorable member's questions are as follows:

1. The published annual reports of the Medical Benefits Fund of Australia Limited and the Hospitals Contribution Fund of New South Wales for the year ended June 30, 1958, list the names of 24 members of the Council of the Medical Benefits Fund and 20 members of the Executive Committee of the Hospitals Contribution Fund as follows:

Council of the Medical Benefits Fund of Australia Limited: Sir Ronald Grieve, Dr. S. P. B. Bellmaine, Dr. D. A. Brown, *Honorable H. V. Budd, M.L.C., *Mr. J. M. Gosper, Dr. G. L. Howe, Dr. H. Hunter, *Dr. A. H. Pollard, Ph.D., *His Honor Judge A. E. Rainbow, Q.C., Dr. W. F. Simmons, *Mr. K. P. Storey, Dr. E. S. Stuckey, Dr. A. E. Lee, Dr. J. R. Adam, *Mr. J. H. Buckle, *Mrs. E. F. Byth, O.B.E., *Mr. J. M. Fegan, Dr. H. W. Horn, Dr. J. G. Wagner, Dr. T. Giblin, *Mr. M. O. Brink, Dr. A. W. O. Young, Sir Herbert Schlink, Mr. W. R. Harrop.

Executive Committee of the Hospitals Contribution Fund of New South Wales: Mr. J. H. Burt, Mr. D. S. I. Burrows, Mr. D. L. Cohen, Mr. L. D. Davis, Mr. R. V. Finlay, Mr. E. E. J. Ford, Mr. W. R. Harrop, Mr. A. M. Hodgson, Dr. H. Hunter, Mr. A. G. Lomer, Mr. J. G. Love, Dr. C. J. McCaffery, Mr. S. O. McKenna, Lieutenant-Colonel J. H. D. Marks, Mr. K. A. Morris, Mr. M. J. O'Neill, Mr. J. M. Pescott, Mr. H. W. Simpson, Mr. S. A. Storey, Mr. S. J. Timbs.

The vocations of the members are not stated.

2. The council of the Medical Benefits Fund comprises persons elected by voting members and persons who are invited to join the council as associate members or as contributors' representatives. The executive committee of the Hospitals Contribution Fund is elected by representatives of constituent hospitals and corporations at the annual general meeting of the fund.

3. The council of the Medical Benefits Fund contains contributors' representatives who are invited to join the council. There are no contributors' representatives, as such, on the executive committee of the Hospitals Contribution Fund.

Hospital Benefits Scheme.

MR. WHITLAM asked the Minister for Health, upon notice:

1. How many claims on registered hospital benefit funds during 1958 qualified for (a) both Commonwealth and fund benefit and (b) Commonwealth benefit only?

2. What was the average amount paid on claims which qualified in each category?

3. What were the principal reasons for refusing fund benefit and what percentage of claims was rejected for each of these reasons?

DR. DONALD CAMERON: The answers to the honorable member's questions are as follows:

1. The information requested is not available but 720,964 claims qualified for Commonwealth additional benefit and 663,609 claims qualified for fund benefit during 1958.

2. For these claims respectively, the average Commonwealth additional benefit paid was £6 12s. 8d. and the average fund benefit £13 7s.

3. The principal reasons for refusal of fund benefit in 1958 were—

- (a) the hospital was not recognized for fund benefit under the organization's rules—26·2 per cent of days for which patients claimed Commonwealth additional hospital benefits.
- (b) The illness was in evidence at time of joining—8·1 per cent of days for which patients claimed Commonwealth additional hospital benefits.
- (c) Maximum annual fund benefits previously paid—3·2 per cent of days for which patients claimed Commonwealth additional hospital benefits.
- (d) Chronic illness—2·1 per cent of days for which patients claimed Commonwealth additional hospital benefits.
- (e) Hospitalization during the waiting period (normally the first two months of membership)—2·1 per cent of days for which patients claimed Commonwealth additional hospital benefits.

Commonwealth hospital benefit was paid in all the above cases.

* Indicates contributors' representatives.

Naval, Military and Air Force.

APPOINTMENTS.

THE following appointments, changes etc., are published in the *Commonwealth of Australia Gazette*, No. 27, of May 7, 1959.

NAVAL FORCES OF THE COMMONWEALTH.

Permanent Naval Forces of the Commonwealth (Sea-Going Forces).

Promotions.—Sub-Lieutenant (U) (on probation) Terence O'Malley is promoted to the rank of Surgeon Lieutenant (on probation), dated 12th January, 1959.

Fixing Rates of Pay.—Surgeon Lieutenant-Commander Brian Tremayne Treloar is to be paid the rates of pay and allowances prescribed for Surgeon Commander, whilst acting in that rank, dated 23rd February, 1959.

Citizen Naval Forces of the Commonwealth.

Royal Australian Naval Reserve.

Promotions.—Surgeon Lieutenant Trevor Nelson Hatfield is promoted to the rank of Surgeon Lieutenant-Commander, dated 22nd November, 1958.

The following appointments, changes, etc., are published in the *Commonwealth of Australia Gazette*, No. 28, of May 7, 1959.

AUSTRALIAN MILITARY FORCES.

Royal Australian Army Medical Corps (Medical).

3/40109 Captain A. O. Donald relinquishes the provisional rank of Major, 31st March, 1959, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical) (Southern Command)), 1st April, 1959.

The Short Service Commission granted to 3/40109 Major (provisionally) A. O. Donald is extended until 31st March, 1959.

Citizen Military Forces.

Eastern Command.

Royal Australian Army Medical Corps (Medical).—The provisional ranks of the following officers are confirmed:—Captains 2/217015 V. W. Bow and 2/206961 R. S. Hyslop. 2/127883 Major J. T. Dunn is appointed from the Reserve of Officers, 28th October, 1958, with regimental seniority effective from 8th May, 1958. *To be Captains (provisionally)*—2/104504 Edward Graham Bosch, 4th March, 1959, 2/67481 John Edward Binnie, D.F.M., 5th March, 1959, and 2/206963 Geoffrey Russell Pritchard, 26th March, 1959. *To be Majors, 1st April, 1959*—Captains (Temporary Majors) 2/127046 R. K. Reid and 2/127049 G. R. W. McDonald, F2/1217 Captain D. G. Greening with pay and allowances of Captain (at own request) and Captains 2/127051 I. H. E. Dawson and 2/127057 B. N. Purser.

Southern Command.

Royal Australian Army Medical Corps (Medical).—5/26466 Major G. I. Howard is absorbed within a vacancy in the authorized establishment of Majors with pay and allowances of that rank, 1st September, 1958.

Reserve Australian Military Forces.

Royal Australian Army Medical Corps (Medical).

Northern Command.—Major H. G. Earnshaw is placed upon the Retired List (Northern Command) with permission to retain his rank and wear the prescribed uniform, 16th March, 1959.

Southern Command.—*To be Honorary Captain, 16th February, 1959*—Julian Bernard Heinze.

Royal Australian Army Medical Corps (Medical).

The following officers are placed upon the Retired List with permission to retain their rank and wear the prescribed uniform, 30th April, 1959.

Northern Command.—Lieutenant-Colonels D. F. Millar and T. R. Biggs, Majors P. B. English and F. K. S. Hirschfeld.

Southern Command.—Major (Honorary Lieutenant-Colonel) M. Sendak, O.B.E., Majors G. G. Godfrey and B. H. McColl and Captain A. G. Carter, M.B.E.

Dated this 28th day of April, 1959.

SEMINAR PROGRAMME, 1959

At the next seminar, to be held on July 11, 1959, Dr. B. P. Scrivener will speak on "Facial Palsy".

Congresses.

CZECHOSLOVAK SOCIETY OF PHYSIOTHERAPY.

THE Czechoslovak Society of Physiotherapy announces that its nineteenth international post-graduate medical course will be held in Carlsbad on September 14 to 19, 1959. The main theme of the course will be gastric diseases, and other subjects from different branches of medical science will be discussed. Papers will be presented by leading research workers from Belgium, Bulgaria,

Notice under Section 134A.

Notice is hereby given that the Medical Services Committee of Inquiry for the State of Victoria, after investigation, having reported on the 10th March, 1959, concerning the conduct of Herman Frederick Kuhlmann of 153 High

[illegible]

¹ Figures in parentheses are those for the metropolitan area.

England, Egypt, Finland, France, Germany, Hungary, Italy, Poland, Rumania, the Soviet Union, Sweden and Czechoslovakia. The official languages are English, French, Russian, German, Slovak and Czech, and there will be simultaneous interpretation in these languages. The scientific programme will be complemented by excursions and by cultural and social events.

The international congress of the Czechoslovak Society of Gastro-Enterology and Nutrition will also be held in Carlsbad from September 21 to 24, 1959. The main subjects for discussion are as follows: (i) infectious hepatitis; (ii) the importance of fats in nutrition; (iii) the surgical treatment of obstructive jaundice.

Applications and inquiries relating to both these congresses should be addressed to the Czechoslovak Society of Physiotherapy, Alvertov 7, Prague 2, Czechoslovakia.

Corrigendum.

BLOOD PRESSURES IN AUSTRALIAN ABORIGINES.

IN the issue of June 13, 1959, on page 819, the signature at the end of the first letter in the correspondence column is incorrectly shown as "D. A. Downing". It should be "D. A. Dowling". We regret this error.

Australian Medical Board Proceedings.

QUEENSLAND.

THE following have been registered, pursuant to the provisions of Section 19 (1) (a) (c) of *The Medical Acts, 1939 to 1955*, of Queensland: Robertson, Alan Ian, M.B., B.S., 1957 (Univ. Queensland); Harte, John Sylvester, M.B., B.S., 1957 (Univ. Queensland); Brannelly, Brian Patrick, M.B., B.S., 1958 (Univ. Queensland); Jackson, Nell Ernest Sandford, M.B., B.S., 1958 (Univ. Queensland); Whitaker, Alan Nelson, M.B., B.S., 1957 (Univ. Queensland).

The following have been registered, pursuant to the provisions of Section 19 (1) (a) (d) of *The Medical Acts, 1939 to 1955*, of Queensland: Nalsh, Rosemary Ruth, M.B., B.S., 1954 (Univ. Adelaide); Gear, Douglas John, M.B., Ch.B., 1952 (Univ. Bristol); Fisher, Hilary Kathleen Jocelyn, M.R.C.S., England, L.R.C.P., London, 1955, M.B., B.S., 1957 (Univ. London); D.A., R.C.P., London, R.C.S., England, 1958; Smith, Ronald James, M.B., B.S., 1955 (Univ. Sydney); Bendelch, Diana, M.B., B.S., 1954 (Univ. London); M.R.C.S., England, L.R.C.P., London, 1954; Misson, Patrick William, M.B., B.S., 1956 (Univ. Adelaide).

The following additional qualifications have been registered: Hede, John Allen, D.P.M., Melbourne, 1959; Lulham, Clifford Robert, F.R.C.S., Edinburgh, 1958; Stephen, Bruce Smith, D.P.M., Dublin, 1958; Kingston, Clive William, D.C.P., 1956 (Univ. Sydney).

Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Bashir, Helen Victoria, M.B., B.S., 1957 (Univ. Sydney), Sydney Hospital, Sydney.

The undermentioned have been elected as members of the New South Wales Branch of the British Medical Association: Erby, Angela Jane, M.B., B.S., 1959 (Univ. Sydney); Tan, Bang Par, M.B., B.S., 1959 (Univ. Sydney); Abbott, John Laurence, M.B., B.S., 1958 (Univ. Sydney); Hicks, Robert Carey, M.B., B.S., 1957 (Univ. London); Monaghan, Brian John Anthony, M.B., B.S., 1958 (Univ. Sydney); Wane, James Marcus Bennett, M.B., B.S., 1959 (Univ. Sydney); Farkas, George Steven, M.D., 1951 (Univ. Budapest) (registered in accordance with the provisions of Section 17 (2A) of the *Medical Practitioners Act, 1938-1958*); Kanarek, Maksymilian, M.D., 1951 (Univ. Cracow) (registered under Section 21A—Regional Registration in respect of the Urbanville-Woodenong Region); Lemeck, Lubomyr, M.D., 1947 (Univ. Innsbruck) (registered in accordance with

the provisions of Section 17 (1) (c) of the *Medical Practitioners Act 1938-1958*); Szabo, Aladar, M.D., 1915 (Univ. Budapest) (registered in accordance with the provisions of Section 17 (2A) of the *Medical Practitioners Act 1938-1958*); Vall, Laszlo, M.D., 1932 (Univ. Budapest) (registered under Section 21A—Regional Registration in respect of the Coramba region).

Deaths.

THE following death has been announced:

VINCENT.—Frank Robertson Vincent, on June 16, 1959, at Frankston, Victoria.

Diary for the Month.

JULY 7.—New South Wales Branch, B.M.A.: Council Quarterly Meeting.
JULY 9.—New South Wales Branch, B.M.A.: Public Relations Committee.
JULY 10.—Tasmanian Branch, B.M.A.: Branch Council.
JULY 16.—Queensland Branch, B.M.A.: Council Meeting.
JULY 18.—Victorian Branch, B.M.A.: Finance Subcommittee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales. Anti-Tuberculosis Association of New South Wales.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

ALL articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations, other than those normally used by the Journal, and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those of the list known as "World Medical Periodicals" (published by the World Medical Association). If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors submitting illustrations are asked, if possible, to provide the originals (not photographic copies) of line drawings, graphs and diagrams, and prints from the original negatives of photomicrographs. Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary is stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

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